

**ALZHEIMER DAILY CARE CENTER
BATHROOM DESIGN**

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ABSTRACT

Alzheimer's disease is a cognitive dysfunction that causes partial loss of emotional, cognitive, and behavioral functions of patients. And this chronic disease is being paid more and more attention today because it seriously affects family lives and social behaviors of patients.

Currently, Alzheimer's has not been controlled by any kind of drug, so non-pharmacological treatment becomes one of the most important means for treating Alzheimer's. As an auxiliary treatment method, interior design helps patients to make greater use of their limited cognitive level, behavioral ability and emotional awareness, to help patients live a better life only at the cost of some space, materials, facilities and activities. Bathing which is indispensable in people's lives is beneficial to patients with Alzheimer's. We tried to create a bathroom to bring both patients and caregivers perfect bathing experience. Taking advantage of the elements of the sensory room, I designed a bathroom that combines dry and wet spaces. With audiovisual scent touching four different sensory elements, patients can enjoy bathing while receiving a variety of aromatherapy, music therapy and sauna therapy.

Keywords: Alzheimer's, Non-pharmacological Treatment, Bathroom, Sensory Room

1. Introduction

1.1 Selection of Subject Research

According to statistics, there are about 40 million patients with Alzheimer's worldwide, most of whom are over 65 years old. It is estimated that by the year 4040, there will be 84 million elderly people in the world suffering from different degrees of Alzheimer's. The number of deaths caused by Alzheimer's increased by 123% in 2000-2015. In the United States alone, one third of the elderly died of Alzheimer's. Due to the growing number of this group, we are facing how to solve this problem, reduce the pressure on society and families, and help with their lives of the patients.

As a designer, I hope to change living environment for a small number of patients, to meet their physiological and psychological needs of life to the greatest extent, as they are not just patients, but people who ever contributed to this society.

Care centers with dormitory-like designs remind patients and caregivers of different functional areas, but I want to create one with no boundaries, in which people care for each other.

The subject of this paper is derived from a phenomenon of water. The term infiltration and penetration are explained in Wikipedia as a phenomenon in which water molecules diffuse through a semi-permeable membrane and from areas with high molecules, such as water molecules. Because of the sensitivity of AD patients to the external world and their fading memory, we need to approach necessary measures to protect them, such as separating them from the world. I am trying to find a new way of reconnecting patient with the outside world, making it easier for patients to accept the world through infiltration.

According to the feedback data from caregivers and family members, we find that bathing is the biggest concern in the care and treatment of AD patients, and studies show that spa has certain effect on non-drug treatment for the elderly with AD, so I chose the design of the spa and toilet system in Alzheimer's Care Center. The concept of infiltration will also be reflected in the design, and I will look for a gentler and safer method for AD patients using spa and toilet systems. Reducing the work of caregivers while improving their using experience of AD patients is the final purpose.

1.2 Purpose of the Research

Apart from cardiovascular disease, cancer and stroke, Alzheimer's disease is a leading cause of death in elderly population, and its incidence increases exponentially with age. As a chronic progressive disease, Alzheimer's disease has not been cured yet so far. It is especially important to provide good and professional care for AD patients to delay the progress, and improve their living ability and quality of life. Living environment plays an important role in influencing the progress of AD patients. It has been increasingly reported that living environments have certain positive effects on AD patients.

I have studied the methods and means for nursing and treating AD patients. Their sensitive, weak and uncontrollable characteristics are the main problems I will face. I hope to find a way to tackle these problems.

Does the external environment have a negative impact on AD patients, and how to establish a relationship between them?

How to address AD patients' fear of water to achieve non-pharmacological treatment of spa?

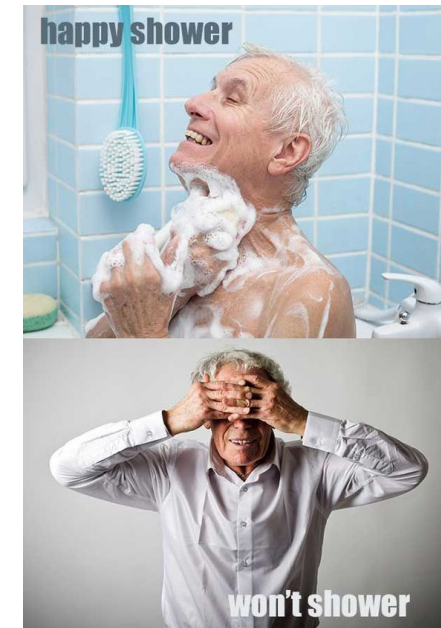
How to relieve the stress of care workers and enable AD patients to use health systems independently?

How to guide AD patients into the water system space?

1.3 Design Purpose

This paper starts with the physiological and psychological needs of patients.

Its hygienic interior design secures superior bathing experience, and AD patients can be benefited from this so as to lead a happier life. The project is trying to solve how to create a comfortable and reasonable bathing space for AD patients.



2 Background

2.1 What Do We Know About Alzheimer's?

Now, we know that Alzheimer's disease is a chronic neurodegenerative disease that usually develops slowly and worsens over time, it will lead to memory, thinking and behavioral dysfunction. Alzheimer's disease is not a mental illness, but an abnormal aging degenerative disease. Alzheimer's disease is the most common cause of dementia, a general descriptive term for memory loss and even other intellectual problems that are severe enough to interfere with everyday life.

Either the daily life of AD patients or the physical and psychological well-being of caregivers are affected. Since taking care of AD patients is a very difficult job, many family members or friends will eventually develop into high levels of emotional stress and even depression.

Alzheimer's disease can worsen over time and eventually lead to death. Although everyone's condition and symptoms differ, the most difficult problem for patients is amnesia, which makes them powerless in family life and work, let alone doing what they were interested in. Other symptoms of the disease include confusion, getting lost in familiar places, putting things in the wrong place, even having difficulty in speaking and writing.

The development of Alzheimer's disease will be different as different factors lead to different courses. In general, the average life expectancy of patients is about 8 years, but there are patients surviving for twenty years. Degradation of the brain may occur in the early stages, to the course of mild to moderate stage, many AD patients can survive for 2 to 10 years, while many patients with severe Alzheimer's disease only have 1 to 5 lifespans.

However, we must face such a reality: on one hand, the prevalence, morbidity, and mortality of AD patients increase rapidly as global aging speeds up; on the other hand, Alzheimer's disease hasn't been cured yet by using technology of modern medicine, and hardly can drugs block the course of its development. As a result, AD patients and their families may shoulder huge burdens, and immeasurable impact will be brought to the whole society and even the country's development. Therefore, it is of great social significance to raise people's awareness of AD's early signs to obtain early diagnosis and treatment, provide reasonable care, improve the quality of life of patients and prolong their lives.

2.2 The Growth Trend of Alzheimer's

After the World War II, some developed countries in Europe and North America, attached great importance to human rights, and architects realizing their social responsibility began to rethink living environment, public health, and people's behavior and psychological problems. [1]As Europe and the United States entered the aging society, the elderly population has become an important group needing cares, coupled with the elderly dementia-related diseases, concern has been raised among the whole society, so after the World War II, following the steps of Nordic countries and other developed countries in Europe, the United States and Australia made great efforts to build up special care facilities for AD patients. Realizing the disadvantages of traditional institutional space environment, experts and scholars from various countries began to focus on the family-style space environment for the elderly and their families to build a suitable living environment for AD patients. [2]

Despite of the gravity of the situation, a mere 3% of the government's medical research budget is being spent on AD research, compared with the 25% being spent on cancer research. Governments estimated that the number of AD cases will rise by 70% to approximately 1.2 million by 2028, increasing further to 1.71 million by 2051 as life expectancy increases. Professor Martin Knapp, from the London School of Economics, predicts a rise of 88% by 2031 when nearly 400,000 patients will be in full-time institutions. However, nursing homes for elderly people with AD have fallen by 9% over past four years .

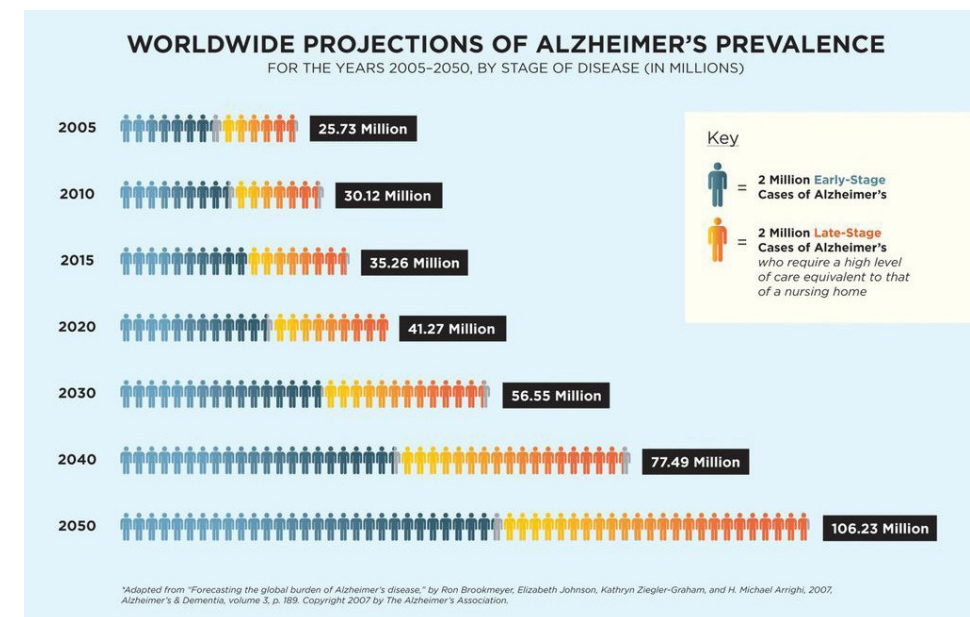
The decline stems from a fundamental cause: a lack of awareness. As for the majority of people, they believe that Alzheimer's can be cured. [3] To create exceptional caring environments, and to better satisfy the needs of older frail adults, many of whom have Alzheimer's disease, we need to think about the relationship between health and a healthy environment. In other words, the issue isn't just associated with indoor air quality, but outdoor.

[1] Nat Liesley, Gillian Crosby, Clive Bowman, Eric Midwinter. The changing role of carehomes[EB/ OL]. Bupa and Centre for Policy on Ageing, 2011.

[2] <http://www.cpa.org.uk/information/reviews/>.

[3] https://www.youtube.com/watch?v=Alzheimer's_Is_Not_Normal_Aging_And_We_Can_Cure_It/Samuel_Cohen/TED

In reviewing the glorious history of Alzheimer's disease, we also have to admit such an objective fact: although remarkable achievements have been made through more than 100 years of exploration and research, we are far from helping people out of Alzheimer's disease. Standing at ends of the scale, we face both growing pressure and burden and limited sources. As one of the costliest chronic diseases, the growing Alzheimer's might incur burden to Medicare. In 2016, an estimated of \$236 billion was spent on health care, long-term care and hospice for people with Alzheimer's and other dementias, with nearly half of the costs borne by Medicare. [4]By 2050, the number of people above 65 with Alzheimer's disease may nearly triple, from 5.2 million to a projected 13.8 million, barring medical efforts to prevent or cure the disease.



[4] <http://www.alz.org/facts>

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[3] <https://www.youtube.com/watch?v=Alzheimer's+Is+Not+Normal+Ageing+And+We+Can+Cure+It/> Samuel Cohen/ TED

[4] <http://www.alz.org/facts>

3 Characteristics of Alzheimer's

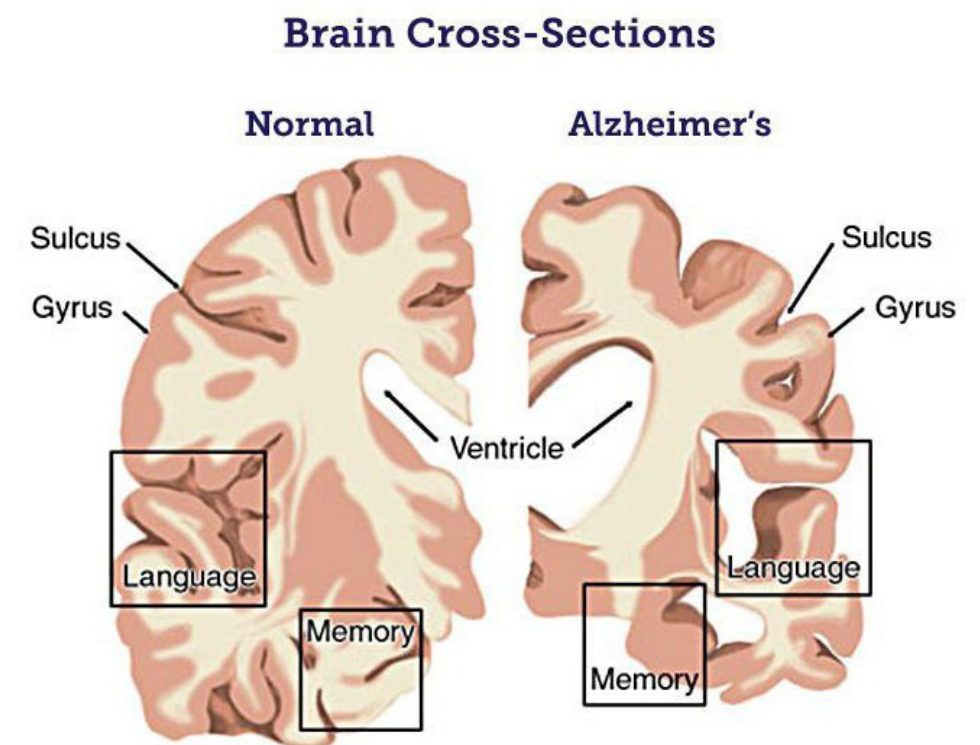
3.1 Signs and Symptoms of Alzheimer's

To find the characteristics of Alzheimer's disease, we must first understand the difference between Alzheimer's disease and aging.

Since ancient times, people have been pursuing longevity, but people always will get old. Aging can make your skin saggy, your pants bulging, your joints hurt and your blood pressure rising, and vulnerable to diseases, it's just for beginners. As aging is inevitable, the physical and mental safety of the elderly decline, perhaps the greatest fear comes with having another birthday is dementia-everyone's nightmare about massive cognitive failure and the eventual loss of self-identity. Contrary to public perception, 60 percent of people over 80 years old live independently in the community.[5]

Meanwhile, neural apoptosis model shows constant apoptosis of nerve is the cause of the aging brain, Cause of decline in aging and the brain function is apoptosis of nerve growth nerve is dominant, Alzheimer's disease, Parkinson's syndrome, high blood pressure and diabetes are common diseases of old age.

At the same time, the problem of memory loss that we are most concerned about is slightly different from Alzheimer's disease.



[5] Crimmins, E., S. Reynolds, and Y. Saito. "Trends in the health and ability to work among the older working age population." 1999.

Age-related Memory Loss & Memory Problems

Remembering and forgetting are both normal aspects of everyday life. As we need to receive a loads of information in daily life, even if we call the brain supercomputing, forgetting may be almost as important as remembering. It is not clear that how the brain stores long-term memory and record information. However, the process is affected by many things, including our emotional state, stress levels, environment around us, old memories, prejudices and perceptions. We know that with age we are more likely to forget, and we may need more time to learn; people who have memory difficulties can consciously recall and record memories. Memory tests have been conducted among those who are 80 years old and 30 years old respectively.[6]

Between the ages of 30 and 70, brain produces about 15% to 20% neurotransmitters, which transmit information between neurons. Hypertension, chronic stress, further deterioration of heart disease and stroke may cause normal memory loss, such as "misplacing a handbag". The latter two may lead to significant and sometimes permanent cognitive problems. For most of us, age-related memory loss is most evident in working memory, for instance, many people do not remember where did they put the car keys. "Some types of memory, especially procedural memory, are often unaffected by aging," notes Laura L. Carstensen, Ph.D., professor of psychology at Stanford University, in Palo Alto, CA. Once you find those keys, your ability to drive remains intact. To manage working memory hitches, it is necessary to keep important items in the same place, such as putting keys on a key rack. Perhaps the glitch adults complain about most is forgetting a word or name you know well.[7]

Compared with those small problems caused by old age, the symptoms of Alzheimer's need to attract people's attention. Alzheimer's disease (AD), also known as Alzheimer's, is a chronic neurodegenerative disease that usually develops slowly and gets worse over time. It is the cause of 60% to 70% of cases of dementia. The most common early symptom is difficulty in remembering recent events (short-term memory loss). As the disease advances, patients may have problems in speaking, and suffer from disorientation (including easily getting lost), mood swings, loss of motivation and selfcare ability, and behavioral issues. As patients' condition declines, they often withdraw from family and society. Gradually, they lose bodily functions, ultimately leading to death. Although the speed of progression can vary, the average life expectancy of patients subjected to diagnosis is three to nine years[8]

[6] AAR P Andrus Foundation. Staying sharp: Memory loss and Aging. 2002

[7] REMEDY's Healthy Living, Spring 2011

[8] https://en.wikipedia.org/wiki/Alzheimer%27s_disease.

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Effects of Ageing on Memory

- Forgetting things occasionally
- Misplacing items sometimes
- Minor short-term memory loss
- Not remembering exact details in early stage of Alzheimer's
- Not remembering episodes of forgetfulness
- Forgets names of family or friends
- Changes only noticed by close friends or relatives
- Some confusion in situations in middle stage of Alzheimer's
- Greater difficulty remembering recently learned information
- Deepening confusion in many circumstances
- Problems with sleep
- Trouble knowing where they are in late stage of Alzheimer's
- Poor ability to think
- Problems in speaking

According to the Alzheimer's Association, the following are the 10 early signs and symptoms of Alzheimer's disease.

- Memory loss that disrupts daily life
- Challenges in planning or solving problems
- Difficulty completing familiar tasks at home, at work or at leisure
- Confusion with time or place
- Trouble understanding visual images and spatial relationships
- New problems with words in speaking or writing
- Misplacing things and losing the ability to retrace steps
- Decreased or poor judgment
- Withdrawal from work or social activities
- Changes in mood and personality, including apathy and depression

3.2 Stages of Alzheimer's

The three STAGES OF DEMENTIA

The most important thing for any designer working in dementia care is to recognise that dementia is a disability and any solutions they design need to offset the effects of the condition. Understanding the degenerative nature of dementia and designing to compensate for its effects become critical in meeting the challenges.

There are different types of dementia, but all have a similar effect on the person with the condition. This section primarily focuses on Alzheimer's as it is the most common form of dementia by far. In most instances, the progression of dementia is slow and consistently changes over time. For the purposes of this publication, this process has been simplified into three stages namely early, mid and late.

Early

In the early stages of dementia, a person will slowly develop changes in their abilities and behaviour. They may not be vocal about problems and will often cover up gaps or lapses in memory. As these can be also attributed to other factors such as stress, bereavement or the natural process of ageing, onset of dementia can be difficult to pinpoint. Very often, it is only diagnosed retrospectively and recognition that someone is in the early stages of dementia is difficult and rare.

An early indicator is difficulty in remembering recent events. People may forget conversations that have recently happened or can become slower at grasping new ideas. Recurring confusion can be another sign but symptoms can be so subtle that they might be limited to occasional lapses that only a close friend, companion or relative might notice.

Care for a person at this stage should be supportive to allow them to retain their independence. It is critical that a carer does not take over tasks completely as this may undermine a person's confidence and their notions of self-worth. A person may experience distress over not being able to complete tasks they could easily accomplish previously. A good practice is to offer reassurance and support. People can also use memory aids to support themselves such as taking notes or using written calendars to remind them of events.

Mid

In the mid stages of dementia, memory lapses and confusion become more obvious and a person can no longer hide it from those around them. Short-term memory becomes impaired and they will often ask many repetitive questions. They may be anxious about when events are happening, become more forgetful and develop difficulties in finding words or remembering names. It is common that they will fail to recognise other people or confuse someone known to them with someone else.

A substantial challenge will be the difficulty they experience in managing everyday life. They may need frequent reminders about activities or how to complete basic tasks. Gradually, the tasks of daily living will begin to become more difficult and they may need help or encouragement with eating, dressing or going to the toilet.

A person may become more socially withdrawn or less comfortable in group situations. In some cases they may also become more socially isolated as friends and family members no longer relate to the person in the same way as they once did and visit less often as a result.

Other difficulties include awareness of their environment. They can often become confused about where they are and wander off and become lost even if they are in familiar surroundings. In some situations this can present a risk to the person themselves and those around them, such as forgetting to light the gas on a stove, trying to drive or leaving an iron on.

The level of care a person needs at this stage increases. Those close to a person have to be vigilant, assessing tasks that the person may no longer be able to complete independently and assisting them where necessary. Activities such as shopping, cooking or anything else that requires a sequence to be completed will become more challenging. Those still living at home will require regular visits to ensure they are eating well, taking their medication and not at risk. Opportunities to connect socially with others will be important. Discussing the options of moving to a care home or increasing the level of daily assistance within their own home will become necessary during this stage.

Late

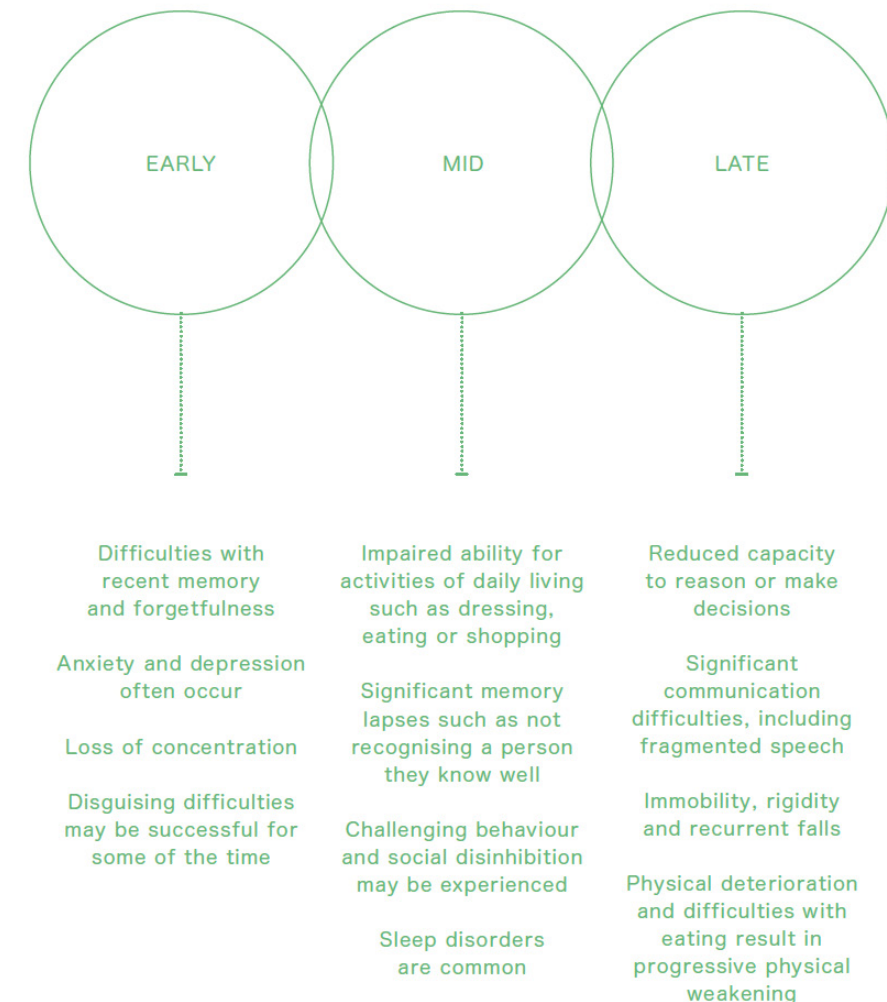
In the late stages of dementia a person will ultimately become dependent on other people for nursing care. Memory loss extends to older memories and a person may not be able to determine the function of familiar objects or recognise people who are close to them. There is a gradual and increased loss of speech. People are often restless and they can have a tendency to want to search for someone or something. A common occurrence is the desire to be with their mother or in their own home, even if that is where they are being cared for.

Some people can have less control of their emotions and become aggressive particularly if they feel threatened. It is common for a person to become increasingly immobile often starting to shuffle when they walk or becoming more unsteady on their feet. Many people can end up being bed bound or confined to a wheelchair. Some of the most challenging problems that can arise include the development of a swallowing problem or incontinence.

Care requirements of a person in the late stages of dementia dramatically increase. A person will need daily, if not full time supervision. Dementia will limit their ability to communicate verbally and they will need high levels of assistance with activities such as bathing and dressing, which can no longer be carried out independently. When levels of assistance increase it is imperative that the person is constantly reminded of who they are and consulted about what they are doing to lessen the feeling that they have no control over the situation. On occasion, individuals might have an angry outburst during an intimate care task. This is a very natural reaction especially if they do not remember or recognise the carer who might appear as a stranger to them.

Despite a person no longer being able to communicate verbally it is still possible to share significant experiences and to communicate using other methods. Holding someone's hand, a smile, the scent of a freshly baked scone, the sound of a loving voice or the feel of an animal's fur can all communicate where words fail. Carers need to be highly resourceful and know a great deal about the person they are caring for in order to find things they can still enjoy and be engaged in.

People will experience good and bad days. There can be moments of real clarity and others where they exhibit severe agitation and annoyance. It is important to share and enjoy the good moments and help a person through the difficult ones. As dementia is prevalent in old age, many people will die in the care of others and in the late stages of dementia. Creating avenues for people to communicate and activities that they can engage in as dementia progresses becomes an important challenge for designers within the care environment.



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- [6] AAR P Andrus Foundation. *Staying sharp: Memory loss and Aging*. 2002
- [7] REMEDY's Healthy Living, Spring 2011
- [8] https://en.wikipedia.org/wiki/Alzheimer%27s_disease.

4 Friendly Environment of Dementia's

4.1 Friendly Environment

Taking Europe and the United States as an example, there are dementia care centers for the elderly before the 1960s, elderly patients with minor physical problems were also taken in, and in 1960-1980, the dementia special care units began to appear in some long-term pension institutions. But in this period, it still developed slowly. From 1980 to the end of the 20th century, dementia care environment has been leaps and bounds, and the number of disabled care units increases. The study on the environment for the care of the elderly has emerged, the space environment from the original institutional, therapeutic into home-style and rehabilitation, design strategy has undergone a fundamental change[9] In the study on environmental behavior psychology for the elderly with dementia, the concept of "Dementia-friendly" is gradually developed. A "dementia-friendly" environment is a system integrating everything, which enable people with dementia to lead a normal life and experience the environment.[10] Current research on "dementia-friendly" environment covers from the interior space to the outdoor landscape, from the building to the city, from the physiological to the behavioral psychology and other aspects. The design' concern has changed from the traditional institutional management to human dignity and independent personality.[11]

Method for Dementia-friendly Environments

As we all know, Alzheimer's disease is a cognitive disorder disease, as it advances, symptoms include problems with speaking and self-care, disorientation (including easily getting lost), mood swings and loss of motivation, and as a person's condition declines, they often withdraw from family and society.

The particularity of AD patients makes their requirements for the environment more special. AD patients' behavior is sometimes affected by the condition, but to some extent, the freedom can give them more opportunities to contact with the outside world to reduce their loneliness. A healthy living environment should be free, so is AD patients' environment. At the same time, how to make patients spontaneously interact with their environment is a question worth thinking about.

[9] <http://medicine.jrank.org/Nursing-Homes-Special-Care-Units.html>.

[10] Sandra Davis, Suzanne Byers, Rhonda Nay, etc. Guiding design of dementia friendly environments in residential care settings: Considering the living experiences [J]. *Dementia*, 2009, 8(2): 185-203.

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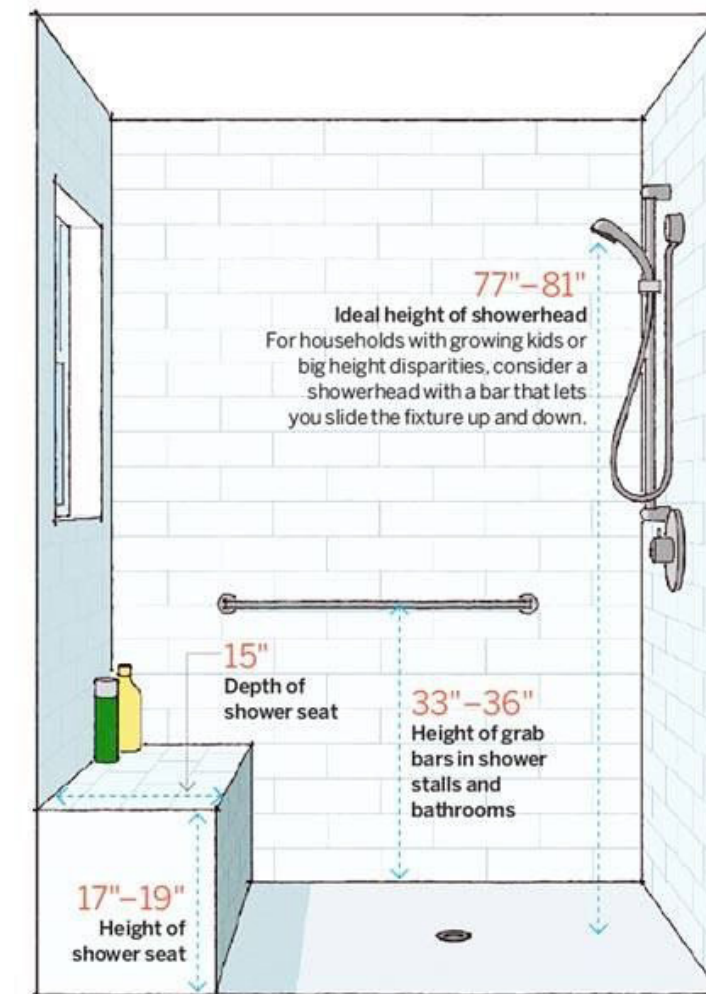
Bathroom

A dementia-friendly bathroom is one where simple, but careful consideration of design can reduce the barriers that people with dementia can face in carrying out daily living activities, greatly improving their safety and preserving their independence for as long as possible.

An estimated 800,000 people in Britain have dementia, with 163,000 new cases diagnosed in England and Wales each year. Dementia can lead to a diminishing ability to perceive danger, and therefore, the bathroom can become a dangerous and confusing place. People with dementia are twice as likely to fall, and these falls result in significantly higher mortality rates than for others in the same age group.

The first consideration of a dementia-friendly bathroom must be safety and protection for the individual. Over time, people with dementia are likely to become less aware of risks such as scalding, while the increased likelihood of falls requires a series of adaptations that go beyond simply installing grab rails. Another key consideration is familiarity. If the adaptation results in significant changes, the person with dementia may fail to recognize their own bathroom, leading to confusion and distress, so adaptations for newly-diagnosed residents should be made as soon as possible after diagnosis to allow them to familiarize themselves with their new surroundings.

Similarly, while short-term memory is impaired, people with dementia usually retain good long-term memory, and may therefore be more comfortable with traditional fixtures and fittings rather than modern designs. Push-button flushes or infrared controls, for example, should generally be avoided in favor of familiar-looking handles. Deluge or 'rainfall' shower heads are also not recommended as being unable to see where water is coming from can be a cause of distress.



The increased risk of scalding to people with dementia means thermostatic taps and showers are essential, allowing the temperature to be set at a safe level. Any object affixed to a wall could be used as a grab rail in the event of a fall, meaning that low surface temperature (LST) radiators or where possible underfloor heating should be preferred to traditional radiators as a means of preventing burns, and for the same reason all pipework should be covered or boxed in.

People with dementia are also likely to become more sensitive to touch and light, meaning that showers should have an adjustable flow to suit the individual user and harsh lighting should be softened. Lighting that creates shadows can be distressing, and cleverly positioned task lighting above the basin, shower and toilet draws attention to these areas to help users find them easily.

While falls are a risk for all frail elderly people, those with dementia face a fall-related mortality rate three times higher than average. Stepping into a bath or shower tray, with the added danger of a slippery surface, therefore becomes a serious hazard for people with dementia. Installing a level-access shower (with non-slip flooring) in preference to a bath therefore reduces the fall risk, as does the inclusion of a shower seat with sturdy arms. Trips can also occur where there is no change in floor level, as people with dementia often perceive a change in floor color as a step up or down. The safest solution is therefore a wet room with a consistent floor color throughout, without a high shine which could lead a user to assume it is wet. Flooring with flecks or small patterns, which could be perceived as dirt or items which need to be picked up, should also be avoided as it could lead to the additional risk of falls.

As well as fall prevention, dementia-friendly bathroom design should also reduce the hazards if a slip or trip does occur. Sharp edges should be avoided as a matter of course. If shower curtains are required, it is recommended to use breathable fabric to prevent suffocation if a person pulls down the curtain as they fall, while PET plastic shower screens are preferable to glass, which is more likely to shatter. Non-reflective or frosted shower screens may be required in a minority of cases, as some individuals with dementia lose the ability to recognize their own reflection which may lead them to believe another person is using the bathroom. For the same reason, any mirrors in the room should be capable of being covered to cater to users with this specific need.

While the primary consideration in a bathroom adaptation must be the safety of the individual user, steps must also be taken to reduce the risk of damage to the building. Memory loss in those with dementia may cause them to forget to switch off taps or showers leading to unintentional flooding. Automatically shutting down after 30 minutes of continuous operation, dementia-friendly showers ensure water is not left running.

Typically, grab rails and toilet seats for those with dementia have always been specified in red as this has been the preferred color. However, leading design experts, occupational therapists and academics specializing in dementia now agree that this is a myth. In fact, any color can be used so long as they contrast strongly enough with the wall behind them. Using different colors is vital in

clearly defining each section of the bathroom and assisting the user to differentiate between shower and toilet areas. A high light reflecting value (LRV) between different surfaces is essential, with a minimum of 30 points of difference providing the required contrast. The toilet should be a different color to the wall behind it, and the seat should be in a third color. Toilet roll holders and grab rails need to contrast strongly with the walls they are attached to, which also provides a visual reminder to use them. Similarly, the shower curtain and seat should be in different colors, each contrasting with the wall behind, to make the shower area easy to locate.

Products designed for users with dementia don't cost any more than those needed for a standard adaptation. However, it is imperative that the right products are selected, following the guidelines carefully, to maximize safety and comfort for residents with dementia.

Spa Space

For people with dementia, bathing is an experience that frequently compromises dignity and independence. The design emphasizes independence and control in bathing (e.g., choice of shower or tub bath), brings a more homelike bathing experience (e.g., less institutional design), and assists caregivers with bathing (additional space, grab bars, etc.).

Bathing is regarded as among the most stressful tasks in caring for people with dementia[12]

Several studies show that traditional bathing brings high pressure. Negative patient reactions are associated with unfamiliar or fearful equipment or procedures, cold tub rooms (cold air or water temperature, chills from slow tub filling or draining), design features that impede bathing (poor lighting, inadequate mats or handrails), and distractions (noisy equipment, running water, or distracting activities outside the bathroom).

Evidence suggests that baths may be less upsetting than showers for patients, though findings are mixed. Natural elements such as natural sounds (e.g., animal and water noises) and pictures (e.g., birds) had a calming effect when introduced during bathing, combined with favorite foods and distracting conversation, agitation during shower will be significantly decreased for patients in late stage of dementia

[12] Kovach & Meyer-Arnold, 1996; Pynoos & Ohta, 1991; Sloane et al., 1995

4.2 The Influence of Living Environment on Alzheimer's



Marian's House has a large, open kitchen and eating area as well as a great room for activities and specialized programming.

To treat dementia, we must find the nature of dementia from the perspectives of medicine, psychology, sociology, and architecture, and then perform specific designs.

The research on behavior and psychosomatic symptoms (BPSD) of demented elderly people is the basis of further analysis and design. Non-drug treatment can improve the patient's condition or slow the progression of the disease. The purpose of intervention is also to improve the quality of life of patients with dementia and delay the development of the disease.

At the psychological level, according to Martin Heidegger's "ontology" perspective, Merleau Ponty's environment guides perspectives, Kit wood's interpersonal relationship stimulates cognitive perspectives, as well as the personality holism of the psychologist Carl Gustav Jung, dementia can cause people to return to the level of collective unconsciousness, made up of "prototypes". This kind of collective memory presented through "prototypes" is the cognitive basis for the existence of dementia patients after cognitive decline and is also the focus of design for and respond to dementia.

From the perspective of sociology, strengthening social contact in external relations, encouraging the establishment of a good relationship with others, and promoting the physical experience of demented patients will reshape or guide the cognitive reconstruction of demented elderly people. The patient-centered theory and methodology is based on sociology.[13]

[13] Jenkins N, Keyes S, Strange L. Creating Vignettes of Early Onset Dementia: An Exercise in Public Sociology[J]. *Sociology*, 2015.

The—prototype revoking||

At the architectural level, specific design for dementia refers to the combination of medical, psychological, and social studies based on specific behavioral and psychosomatic symptoms (BPSD) of demented elderly and the integration of specific design in the facility to help delay the patient's disease progression, reduce the pressure of care, and eventually help the demented elderly realize their self-esteem, sense of belonging, sense of control and existence.

Based on the theories above, the "Prototype Revoking" model is proposed, which is the theoretical system of specific designs for dementia.

The—prototype revoking|| model refers to the strategy that the specific design for dementia will take advantage of the—prototypes|| that can be accepted by the elderly and cause cognitive stimulations. The—prototypes|| will cause basic sensations that can be stimulated to guide and influence the elderly and conduct appropriate and reasonable activities in the space. Thus, an environment will be created in which the elderly is closely connected with the society. In that environment, different means of treatment are integrated, so that the elderly with dementia can receive non-drug treatment and exercise in the space and protect the patient's self-esteem (Self-respect), Sense of Belonging, Perceived Control, and Identity Obstacles.

Due to the special physiological and psychological characteristics of the dementia elderly and the corresponding nursing mode, the space design of the living room is challenged. Incorporating targeted design into space is conducive to delaying the development of patients' condition, reducing the pressure of nursing, and ultimately helping the demented elderly to achieve their self-esteem, sense of belonging, sense of control and existence.

Dementia-specific design refers to the specific behavioral and psychiatric symptoms (BPSD) of dementia, combined with medical, psychological, social and other aspects to explore the dementia-targeted space suitable for their behavioral status and spiritual needs. The design of the elderly facilities incorporates measures to delay the condition of dementia, with a view to providing space for the elderly to provide safe, comfortable, and conducive ways to delay cognitive decline and provide exercise.

The concept of "Prototype" means that due to cognitive decline caused by dementia, human consciousness gradually loses its individual unique consciousness and individual unconsciousness, and returns to the level of collective unconsciousness, leaving only human instinctual cognition. This instinctive cognitive segment and personality segment can be called a "prototype."

Currently, people still have four parts of needs: Self-respect, sense of belonging (Sense of Belonging), Perceived Control, and Identity Obstacles. Dementia After the brain is declining, these still existing personality instinct and basic senses will be the focus of dementia-oriented architectural design. For the design of dementia architecture, based on the characteristics of dementia cognition, to achieve these four parts of personality needs.

Based on the theoretical point of view, the "Prototype Recalling" model is proposed, which is the theoretical system for the deceptive design of dementia.

The "prototype arousal" model means that dementia is designed to use the space of the building space, to use the "prototype" that the elderly can accept, to cause cognitive stimuli, to use the basic senses that can be stimulated, to guide and influence the elderly. Appropriate and reasonable activities in the space create a space environment that is closely related to the society for the elderly and integrates the means of treatment, so that the dementia elderly can receive non-drug treatment and exercise in the space.

The "Prototype Arousal" mode mainly consists of two parts:

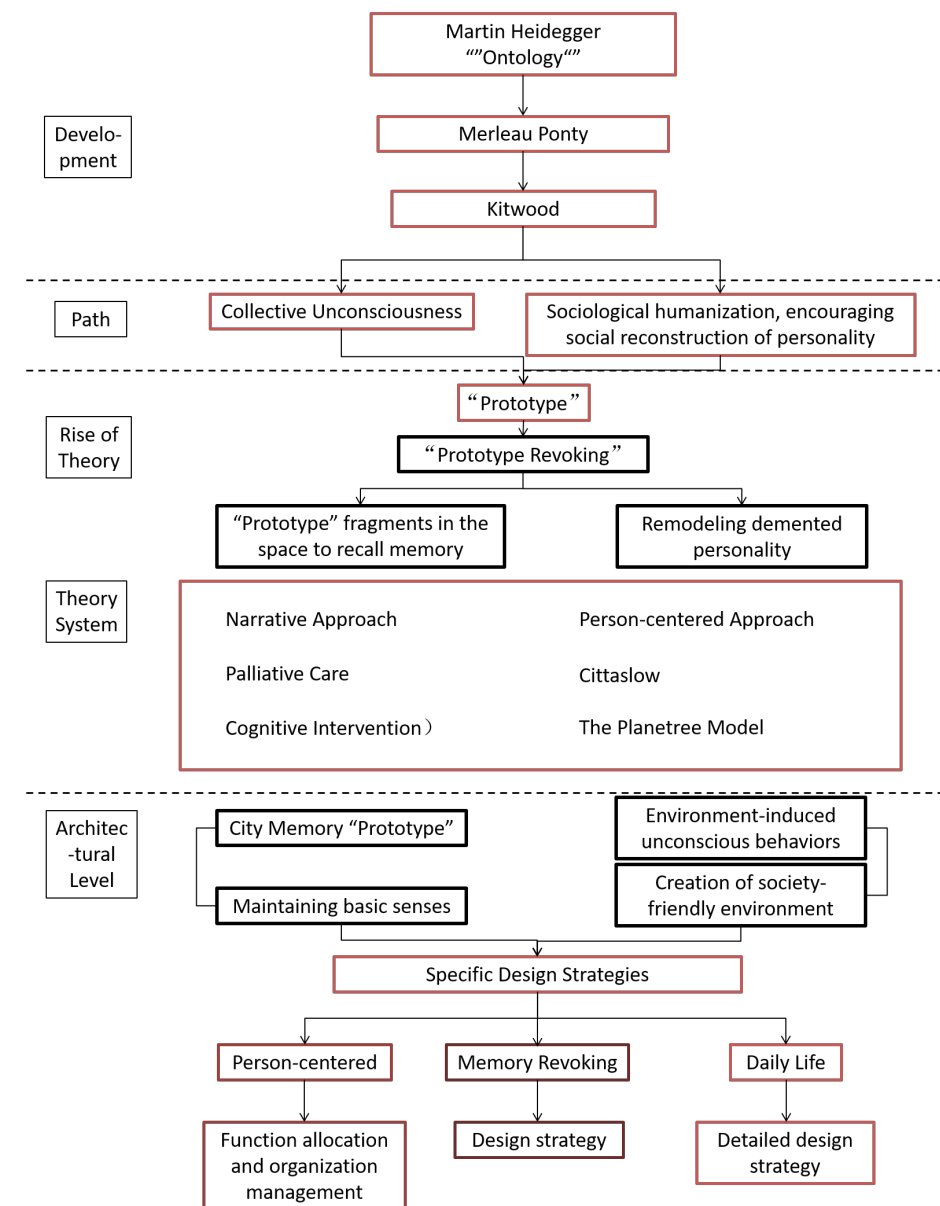
(1) Space provides a "prototype" fragment that evokes collective memory.

(2) Strengthen social and environmental reshaping of dementia personality.

The two-part system is developed from two aspects, complementing each other: mining the ontological characteristics of the patients with dementia; and emphasizing environmental guidance and reshaping for the outside world of dementia patients. The "Prototype Arousal" model is a system of a combination of dementia coping strategies that provides the basis for spatially targeted design of dementia.

According to behavioral and psychiatric symptoms (BPSD) analysis, with the gradual disappearance of cognitive ability and memory of dementia, the old dementia will rely on the "prototype" to stimulate and rely on the basic senses to perceive. Dementia is caused by neurological regression. Cognitive decline makes the elderly rely more on the basic senses (five senses including hearing, taste, smell, touch, and vision) for archetypal perception; the deterioration or loss of nerves affects the sense of smell and vision. At the same time, hearing is also hurt as cognitive function deteriorates.[14]

Therefore, in the architectural space, the excavation and use of fragments of the elderly, historical fragments and fragments of the building, repeated stimulation of the dementia elderly, combined with space, training for the five senses, is a building space strategy to delay the development of the disease.



[14] Wang Ningning, Dong Huiqing. Auditory system damage in Alzheimer's disease [J]. International Journal of Otorhinolaryngology Head and Neck Surgery, 1996(6): 342-344.

Design aims at making spatial organization and physical environment a blessing for people with dementia. For example, it tries to minimize the feeling of over-stimulation that afflicts many people with dementia, such as specifying quiet rooms with soft colors, eliminating unnecessary confusion and deleting the paging system.[15]

For all inspiration, it is often required to improve the quality of life in an institutional setting (for example, design strategies to increase residents' sense of family and autonomy). These values - the necessary dignity, privacy, etc. - can be said to be "inalienable rights"[16]

Design is about more than shaping the physical environment to counter the impairments which come with dementia. It depends addressing standards, behavior and behaviors and professional staff and changing the way people with dementia are engaged with in the environments in which they live.

Age-related changes and impairments can make it more difficult to understand and navigate the built environment. These can be sensory, mobility or cognitive impairments, and sometimes a combination, which can affect functioning, behavior, and ultimately, quality of life. Understanding such impairments is the first step towards creating living environments which support the needs of older people and those with dementia, keeping them safe from dangers such as falls, which can have a devastating effect on an older person; allowing the freedom and confidence to use Their abilities to the fullest extent, in all things from the mundane to the creative; aiding memory in day-to-day living; and reinforcing personal identity.

Lighting and Visual Contrast

People with dementia face visual deficits, including difficulty with color discrimination, depth perception, and sensitivity to contrast. These deficits exacerbate normal changes in vision that accompany aging, such as irritation from glare and changes in color perception. So in the design, it is recommended to reduce glare, increase contrast, minimize confusion concerning depth perception and increase overall light levels and exposure to bright light.

Compared with other elderly adults, people with dementia are exposed to inadequate levels of bright light.[17]According to findings from two studies, bright light treatment consistently regulated circadian rhythms and improved sleep patterns among people with dementia.[18]

Most often, research on the effects of bright light is conducted under laboratory conditions, requiring special equipment on patients. Limited attention has been paid on the effects of bright light as a regular environmental feature. According to one quasi-experimental study, researchers examined the effect of ceiling-mounted light fixtures that provided high intensity illumination.[19] Bright light administered in this fashion fostered behavioral improvements and increased circadian rest-activity rhythms among 22 people with severe dementia. Patients in facilities with low overall light displayed higher agitation levels.

[15] Brawley, 1997; Cohen & Weisman, 1991

[16] Lawton, 1981, p. 245

[17] described as light exceeding 2,000 lux; Camp-bell, Kripke, Gillin, & Hrubovcak, 1988

[18] Mishima et al., 1994; Satlin, Volicer, Ross, Herz, & Campbell, 1992

[19] 790-2,190 lux; Van Someren, Kessler, Mirmiran, & Swaab, 1997

Little research on the impacts of visual contrast in dementia care environments was identified, though this strategy is frequently recommended to enhance “legibility” or clarity of the environment.

Patients’ attempts to leave institutions or homes seems a major safety concern for staff and family caregivers. The design addresses the concern by exploiting patients’ cognitive deficits.

A design strategy capitalized on the likelihood that, because of problems with depth perception people with dementia may interpret two-dimensional patterns on the floor as three-dimensional barriers. In a quasi-experiment with some patients, such two-dimensional grids successfully eliminated most exit attempts for some patients[20] In other studies, two-dimensional grids either increased or failed to decrease patients’ exit attempts.[21] Failure to reduce exiting was attributed to the presence of glass doors and adjacent large windows, which offered views to attractive, nearby outdoor spaces.[22]. Attractive views were hypothesized to distract patients from two-dimensional grids or to entice patients to over-come their aversion to these optical illusions. Displayed in a study, installation of closed, matching miniblinds that restricted light and views through exit door windows decreased exit at-tempts by half.[23]



Normal



AD Patients

CASE STUDY

McNair D., C. Cunningham, R. Pollock and B. McGuire. 2011. Light And Lighting Design For People With Dementia. Australia: Hammond Press

This is from a book published by Hammond, Australia. It shows that the same scene in the eyes of normal eyes and AD patients is different. Due to the deformation of the lens and the aging problem, the patient's vision can't clearly distinguish the color, so in the design we need to use a more intense color to mark the danger in a small amount, and the too strong contrast color will make the patient feel the tension, so for example The large area of the wall and ceiling requires soft colors to reduce the patient's nervousness.

[20] Hussian & Brown, 1987

[21] Chafetz, 1990; Namazi, Rosner, & Calkins, 1989

[22] Morgan & Stewart, 1999

[23] Dickinson, McLain-Kark, & Marshall-Baker, 1995

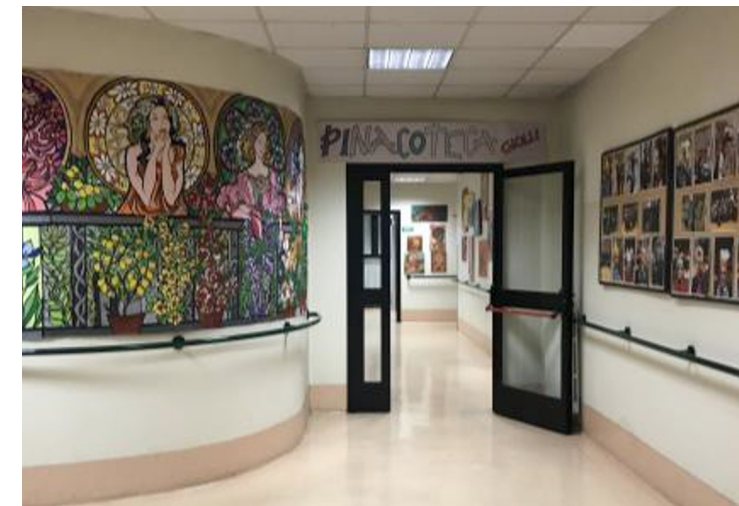
CASE STUDY

MILAN GIOLLI COMMUNITY SENIOR CENTER

USES PAINTING TO SHOW THE GUIDING PATH

Using the guiding role of markers to attract the elderly to "encounter" the memory nodes in space.

According to the life experience of the demented elderly people received by this institution, the "city image" of Kevin Lynch is specifically combined with the "marker" and "node" guiding space on the traffic path. Nodes and markers are set at the position of the path, and the elderly enjoy a good visual space during the movement; through the spatial guidance of the markers, the elderly who are demented are constantly attracted by the space of the next station, thereby using the environment. It drives the continuous activities of the elderly who are leading the cognitive decline, one stop after another, to help the elderly to participate in passive activities.



4.3 The Influence of Sensory Room on Alzheimer's

Snoezelen, multi-sensory stimulation, provides sensory stimuli to stimulate the primary senses of sight, hearing, touch, taste and smell, using lighting effects, tactile surfaces, meditative music and the odor of relaxing essential oils. The rationale for this lies in the proposition that the provision of a sensory environment for people with dementia places fewer demands on their intellectual abilities but capitalizes on their residual sensorimotor abilities.[24]

Derived from two Dutch verbs, 'sniffen' and 'doezelen', Snoezelen was first introduced in the 1970s as an intervention for people with learning disabilities, based on the rationale of reducing the adverse effects of sensory deprivation. Owing to their reduced cognitive abilities, people with learning disabilities are less ready to explore their environments for sensory inputs, and consequently they are likely to be deprived of adequate sensory stimulation. The expression of negative emotions and behaviors, such as vocally disruptive, self-stimulating, and apathetic behaviors, has been found to be associated with sensory deprivation. Adopting a non-directive and enabling approach, Snoezelen encourages people with reduced cognitive functions to engage with sensory stimuli in a positive and non-stressful environment. Snoezelen has been described as a 'sensory cafeteria' or 'multi-sensory environment' because of its use of a variety of sensory-based materials and equipment. Pinkney 1997 describes Snoezelen as a medium of providing sensory stimuli to the primary senses of sight, hearing, touch, taste and smell, using lighting effects, tactile surfaces, meditative music and the odor of relaxing essential oils.

Some researchers regard Snoezelen as a 'multi- sensory therapy' in which people with dementia are encouraged to engage in a cognitively less demanding sensory environment. [25] The goals of such therapy are to promote positive behaviors and to reduce maladaptive behaviors. Whether Snoezelen is considered simply as a multi- sensory environment or as a therapeutic medium has attracted significant debate. Proponents of the former school of thought have pointed out that the value of Snoezelen lies in its aesthetic quality, and its use as a therapy undermines this characteristic.[26] Supporters of the therapeutic value of Snoezelen are keen to explore its benefits for individuals with cognitive impairments.[27] In this review, Snoezelen is regarded as a multi-sensory based intervention with embedded therapeutic values.

[24] Chung JCC, Lai CKY. Snoezelen for dementia. Cochrane Database of Systematic Reviews 2002, Issue 4. Art. No.: CD003152.

DOI: 10.1002/14651858.CD003152.

[25] Burns 2000

[26] Hutchinson 1994

[27] Hulsegge 1987; Kewin 1994

Over the past decade, the clinical application of Snoezelen has been extended from the field of learning disabilities to the care of people with dementia. To a certain extent, these two groups of individuals share some common characteristics such as reduced cognitive functions and diminished communicative ability. However, people with dementia generally experience a gradual deterioration in all aspects of cognitive functions as the disease progresses. This progressive loss of cognitive abilities makes this group less suitable to participate in interventions that demand cognitive functions and communication ability. In addition, people with dementia are less competent and have a lower stress threshold for coping with environmental demands. Maladaptive behaviors and affect occur when environmental stimulation exceeds an individual's adaptive level. On the other hand, too little sensory stimulation may lead to a decline in both cognition and function, and an increase in behavioral symptoms. Based on these two hypotheses of sensory overload and sensory deprivation, Kovach 2000 put forward the model of sensor stasis, in which an equilibrium of the sensory state can be attained by balancing the pacing of sensory stimulating or sensory-calming activity.

The value of Snoezelen (multi-sensory interventions) has been documented in promoting relaxation and positive behavioral changes. Through the provision of non-sequential and unpatroned sensory stimuli, Snoezelen capitalize on the residual sensorimotor abilities of dementia sufferers and present few attentional and intellectual demands. [28] Moffat and colleagues pioneered the use of Snoezelen for people with moderate to severe dementia and found that they enjoyed the sensory stimuli and remained calm during the sessions. These encouraging results promote the use of multi-sensory interventions in dementia care and have provoked waves of clinical research on the examination of therapeutic values of Snoezelen for people with dementia.

[28] Baker 2001; Beatty 1998; Buettner 1999; Hope 1998



SNOEZELLEN & ALZHEIMER Snoezelen room in Liège

A review of the literature shows that Snoezelen is commonly employed as a therapeutic modality in dementia care in four areas:

- (1) reducing maladaptive behaviors and increasing positive behaviors.[29]
- (2) promoting positive mood and affect.[30]
- (3) facilitating interaction and communication, and
- (4) promoting a caregiving relationship and reducing caregiving stress.[31]

So, the design calls for appropriate levels of sensory stimulation, striking a careful balance between environmental overstimulation and deprivation. Recommendations include removing unnecessary clutter, providing tactile stimulation in surfaces and wall hangings, and eliminating overstimulation from tele-visions, alarms, and so forth.[32]

[29] Baker 2001; van Diepen 2002; Hope 1998; Long 1992

[30] Baker 2001; Cox 2004; Pinkney 1997

[31] McKenzie 1995; Savage 1996

[32] Evans, 1989; Hall, Kirschling, & Todd, 1986

CASE STUDY

MILAN VILLAGGIO AMICO

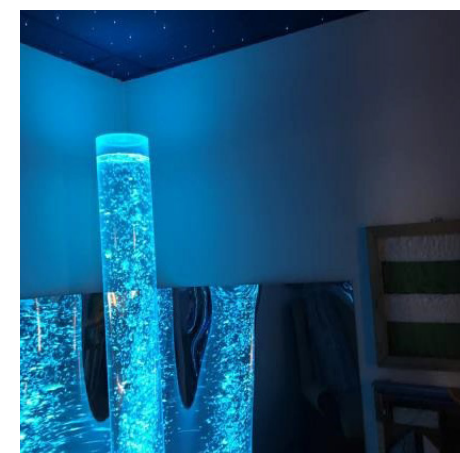
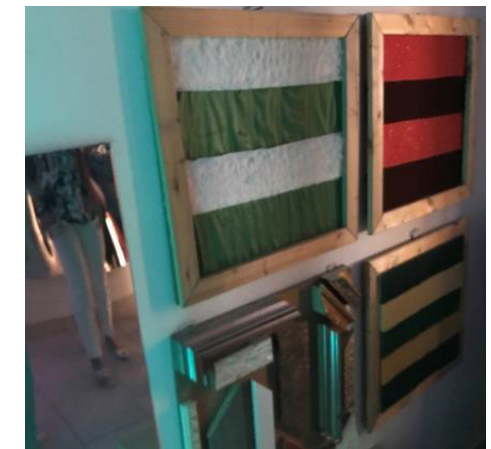
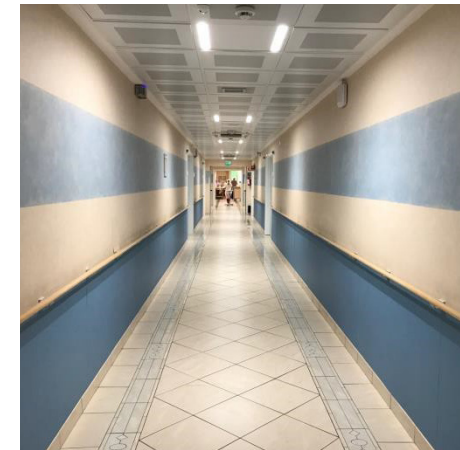
COMMUNITY SENIOR CENTER

The voice has the ability to express the space, express the material, and create a space atmosphere. When the demented old man loses sensitivity to the sound, it forms an "environmental suggestion" through the sound, evoking the memory of the demented old man's daily life. It is an effective sense of the five senses. treatment. .

They address the problem of declining cognitive ability of the elderly with dementia, and release the scent that has an important reminder effect in combination with the daily activities of the elderly. For example, when the time of the meal is to be released, the chocolate and coffee aroma are released to remind the elderly to dine, when the old man is about to rest. The release of floral notes reminds the elderly to start a rest, etc., to create a life-like scene through olfactory perception.

In the environment where the elderly live for a long time, natural elements occupy a large proportion. Therefore, the ground of the institution has chosen a brown ground rubber material, while the door for the elderly with dementia has chosen a more vivid green color, metaphorizing the earth and trees in the natural environment.

Softer, warmer materials are often used in the bedroom to remind the demented old man that it is a place to rest; the warm touch creates a warm family life scene with a fireplace, helping the elderly to give feedback on spatial memory and exercise their senses; The different textures suggest that the old man is moving from one space of the family to another.



CASE STUDY

CASE STUDY

SNOEZELLEN & ALZHEIMER

Snoezelen room in Liège. Mony, 85, who has Alzheimer's disease, moves around in this multi-sensory environment, which is both soothing and stimulating, with Marc Thiry, a physiotherapist specialising in psychomotor education. Professor Thiry has been following Mony since her disease was diagnosed 5 years ago. By stimulating the senses, these rooms allow people with Alzheimer's, who, despite their disease, maintain a sensorial memory, to lower their anxiety levels. These rooms are as beneficial to the patients as to the medical staff, allowing a privileged relationship to be established between the two, and setting up means of communication other than speech. This room is equipped with a liquid oil disc lamp that has a relaxing, and even hypnotic effect, and a water bed heated to 37°C that plays music. Model released MR ©ABK / BSIP / The Image Works France



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5 Sundowning of Alzheimer's patients

5.1 What is Sundowning?

When you have Alzheimer's disease, you may notice a big change in their behavior late in the afternoon or in the evening. The doctor calls it Sunset or Sunset Syndrome. Sunset or Sunset Syndrome is a neurological phenomenon associated with confusion and irritability in patients with delirium or some form of dementia. The most common is Alzheimer's disease, but there are other forms of dementia. The word "sunset" was created because of the time the patient was confused. For patients with sunset syndrome, many behavioral problems occur at night or when the sun sets. In the mid-stage of Alzheimer's disease and mixed dementia, sunset seems to occur more frequently. Patients are usually able to understand that this pattern of behavior is abnormal. Sunset seems to fade as the patient's dementia progresses. Studies have shown that 20-45% of Alzheimer's patients experience some sort of sunset chaos. Fading light seems to be a trigger. As the night progresses, the symptoms may get worse and usually get better in the morning.

Sundowning, or sundown syndrome, is a neurological phenomenon associated with increased confusion and restlessness in patients with delirium or some form of dementia. Most commonly associated with Alzheimer's disease, but also found in those with other forms of dementia, the term "sundowning" was coined due to the timing of the patient's confusion. For patients with sundowning syndrome, a multitude of behavioral problems begin to occur in the evening or while the sun is setting. Sundowning seems to occur more frequently during the middle stages of Alzheimer's disease and mixed dementia. Patients are generally able to understand that this behavioral pattern is abnormal. Sundowning seems to subside with the progression of a patient's dementia. Research shows that 20–45% of Alzheimer's patients will experience some sort of sundowning confusion.

Symptoms are not limited to but may include:

- Increased general confusion as natural light begins to fade and increased shadows appear.
- Agitation and mood swings. Individuals may become frustrated with their own confusion as well as aggravated by noise. Individuals found yelling and becoming increasingly upset with their caregiver is not uncommon.
- Mental and physical fatigue increase with the setting of the sun. This fatigue can play a role in the individual's irritability.
- Tremors may increase and become uncontrollable. [citation needed]
- An individual may experience an increase in their restlessness while trying to sleep. Restlessness can often lead to pacing and or wandering which can be potentially harmful for an individual in a confused state.

While the specific causes of sundowning have not been empirically proven, some evidence suggests that circadian rhythm disruption increases sundowning behaviors. In humans, sunset triggers a biochemical cascade that involves a reduction of dopamine levels and a shift towards melatonin production as the body prepares for sleep. In individuals with dementia, melatonin production may be decreased, which may interrupt other neurotransmitter systems.

Sundowning should be distinguished from delirium and should be presumed to be delirium when it appears as a new behavioral pattern until a causal link between sunset and behavioral disturbance is established. Patients with established sundowning and no obvious medical illness may be suffering from impaired circadian regulation or may be affected by nocturnal aspects of their institutional environment such as shift changes, increased noise, or reduced staffing (which leads to fewer opportunities for social interaction).

Disturbances in circadian rhythms

It is thought that with the development of plaques and tangles associated with Alzheimer's disease there might be a disruption within the suprachiasmatic nucleus (SCN). The suprachiasmatic nucleus is associated with regulating sleep patterns by maintaining circadian rhythms, which are strongly associated with external light and dark cues. A disruption within the suprachiasmatic nucleus would seem to be an area that could cause the types of confusion that are seen in sundowning. However, finding evidence for this is difficult, as an autopsy is needed to definitively diagnose Alzheimer's in a patient. Once an Alzheimer's patient has died, they have usually surpassed the level of dementia and brain damage that would be associated with sundowning. This hypothesis is, however, supported by the effectiveness of melatonin, a natural hormone, to decrease behavioral symptoms associated with sundowning.

Another cause can be oral problems, like tooth decay with pain. When the time a meal is served comes close, a patient can show symptoms of sundowning. This cause is not widely recognized; however, anticipation of food can increase dopamine levels, and dopamine and melatonin have an antagonistic relationship. [33]

[33] Wikipedia Keywords :Sundowning

5.2 treatment for Sundowning

- If possible, a consistent sleeping schedule and daily routine that a sufferer is comfortable with can reduce confusion and agitation.
- If the patient's condition permits, having increased daily activity incorporated into their schedule can help promote an earlier bed time and need for sleep.
- Check for over-napping. Patients may wish to take naps during the day, but unintentionally getting too much sleep will affect nighttime sleep. Physical activity is a treatment for Alzheimer's, and a way to encourage night sleep.
- Caffeine is a (fast-working) brain stimulant but should be limited at night if a night's sleep is needed.
- Caregivers could try letting patients choose their own sleeping arrangements each night, wherever they feel most comfortable sleeping, as well as allow for a dim light to occupy room to alleviate confusion associated with an unfamiliar place.
- Some evidence supports the use of melatonin to induce sleep.

NON-PHARMACOLOGIC THERAPY Physical Activity/Socialization Daytime physical activity has been associated with better rest-activity rhythm. Increasing daytime physical activity in patients with dementia may improve sleep. Thereby reducing the discomfort brought by the Sundowning to the patient.



Music Therapy

Music therapy (MT) includes the use of musical experiences and a Trained music therapist to create relationships with patients with the goal of improving health. A SR found that music therapy did show an improvement in sundowning g, but this review has only been published in abstract form to date. Two small trials of 56 and 45 patients with dementia were conducted. Patients with dementia residing in nursing homes received MT provided by trained music therapists. The MT groups received up to 12 sessions (30 minutes per session) and the control group underwent standard care (e.g., educational or entertainment activities). In the first study there was a statistically significant improvement in NPI scores in the MT group. Statistically significant improvements in the assessed NPI behaviors Included anxiety, agitation, irritability and nighttime behavior disturbances. In the second study, there was a statistically significant improvement in disruptiveness, but not agitation as measure by the CMAI. No adverse effects were reported. None of these studies were blinded at any Level. The implementation of MT may be challenging as it is dependent on the availability of trained music therapists.

Bright Light Therapy

Bright light therapy (BLT) refers to visible light that is usually administered from a light box, or alternate dawn-dusk simulation, and can vary in intensity, duration, and timing. It is thought that degenerative changes in the SCN, which is Worse in people with dementia, contribute to circadian rhythm disturbances. It is hypothesized, based on animal studies, that BLT may improve age-associated disturbances in circadian sleep-wake rhythm, by positively stimulating SCN neurons. A 2009 SR has examined the benefits of light therapy for dementia and discusses the impact on measures of behavioral disturbances or psychiatric disturbances. Five RCT assessed behavioral disturbances using a variety of scales. BLT > 2500 lux from a light box, administered daily for a mean of 92 minutes had no Effect on behavioral disturbances in the evening assessments following 10 days of treatment, or after one year of treatment. The combination of overhead light and melatonin significant i Improved scores on the CMAI over a period of 3.5 years. In this study no serious adverse effects were noted. The most common adverse events were drowsiness and irritability. A recent SR published in abstract only, reviewed 12 studies on bright light therapy, and Found that exposure in the morning and afternoon improved sundowning syndrome. A single center RCT of nursing home patients with dementia, randomized participants to daily BLT (light box with 10000 lux) or standard fluorescent tube light at 100 lux for two hours between and the noon for two weeks. There was no difference on rating scales between groups. BLT appears to be well tolerated but has uncertain benefit for improving agitation. Optimal dose, administration method and whether it should be used in conjunction with melatonin therapy remains unclear.

Aromatherapy

Aromatherapy uses essential oils to benefit a pers One's well-being. Lavender oil's (Lavandula angustifolia) proposed therapeutic mechanism is due to its sedative effects following inhalation. An updated Cochrane review has examined the evidence for aromatherapy in dementia, of studies using a variety of compounds (e.g., 10% Melissa Essential oil & base oil; cypress, lime, and eucalyptus essential oils in lotion; and lavender oil). Of the four included RCTs, two studies peripherally address SD behavior, although this is not explicitly stated. A single blind RCT of 21 inpatients with dementia compared 3 interventions' impact on behavior disturbances: (1) lavender oil applied topically through massage, (2) lavender in a diffuser plus conversation, (3) massage only.

Treatments were administered twice weekly, and participants continued their regular medications. Behaviors were recorded using a video camera for 4 one-hour periods. There was no overall statistical difference between treatment groups. However, aromatherapy plus massage showed a statistically significant Reduction in motor behaviors between the hours of 3-4 pm, which the authors suggest, could represent a reduction in agitation. conducted a cross-over randomized study of 70 residents with dementia living in nursing homes. The effects of lavender oil as compared with sunflower oil

(placebo) aromatized for one-hour overnight were assessed using The Chinese versions of the CMAI, and NPI. Participants were randomly assigned to a therapy for 3 weeks, then received a wash out period of 2 weeks, The followed by the other therapy for three weeks. The authors reported a statistically significant decrease in nighttime behaviors. No dropouts, adverse effects or changes in psychotropic medications occurred during the study. However, it has also reported that aromatized lavender oil worsened agitation in One patient with severe dementia in a placebo-controlled trial. In view of these controversial findings, a consultation with a qualified aromatherapist may be warranted. Links Further studies on the management of SD are required to inform clinicians about optimal treatments. Focus on the time of day of behaviors, and the response to therapies at specific hours. Studies should also be later than a few weeks and should be optimally designed with randomization and a control group.



Based on the limited and conflicting evidence, it is difficult to directly compare therapies for the management of SD. There is limited evidence supporting non-pharmacologic interventions. Clinicians may want to trial MT or BLT. Further research is required to determine if aromatherapy or physical activity result in reduced SD. Studies involving non-pharmacologic therapy show minimal safety concerns, but the duration of treatment, cost, and impact require further research. Pharmacologic therapy is associated with safety concerns, but these are minimal in the studies with melatonin. In addition, melatonin has modest evidence and could be prescribed to spare patients of the potential adverse effects of APs or who have not responded to other therapies.[34]

From the above studies, we can conclude that the sunset syndrome of patients with Alzheimer's disease has a great relationship with sleep and melatonin levels.



[34] "Sleeplessness and Sundowning". Alzheimer's Association.

5.3 Change of Melatonin

Effective cures remain elusive for both dementia and dementia-related sleep disorders, but certain treatment methods can alleviate most of the persistent symptoms. Medications can restore or improve cognitive function for patients with Alzheimer's and dementia; however, medications that alleviate the symptoms of insomnia and other sleep disorders for dementia patients have yet to be pinpointed. A meta-study by the UK-based Cochrane Group noted that "there is very little evidence to guide decisions about medicines for sleeping problems for" people with Alzheimer's.

The incidence of sleep-disordered breathing (SDB) in demented patients is high because neuronal damage contributes to the respiratory problems during sleep, and in turn results in cognitive impairment common in dementia. SDB is usually treated by using continuous positive airway pressure (CPAP) machines. According to most home health care practitioners, the general rule of thumb is that patients with dementia can tolerate up to five hours of CPAP per night. CPAP therapy has been shown to decrease the incidence of SDB episodes for dementia patients from 24 to 10 per hour during sleep. CPAP treatment also decreases daytime sleepiness, and there are some indications that CPAP retards cognitive impairment for demented patients. Institutional caregivers have self-reported that CPAP treatment can decrease snoring for dementia patients, elevate their moods and improve their overall quality of life. [35]

Taking a cue from the established correlation between circadian rhythms, agitation and light exposure in demented patients, some doctors have begun using therapeutic strategies with bright light exposure to regularize sleep patterns. Melatonin and melatonin agonists have also attracted attention in recent years as a possible method of mitigating insomnia and other sleep disorders, as well as addressing symptoms of Alzheimer's.

Most experts today recommend safety precautions for dementia patients – particularly those who have been diagnosed with RBD – to reduce the risk of injury during sleep. Caregivers or live-in family members should remove dangerous objects (such as weapons) from the bedroom, lock all doors and windows, and follow up regularly with a doctor to monitor signs of brain degenerating diseases.

In nursing homes and other institutionalized care facilities, sedatives are often delivered to patients to ensure nighttime sleep. But cognitive functions may be further vitiated by sedative usage, so overuse of medications should be avoided if possible.

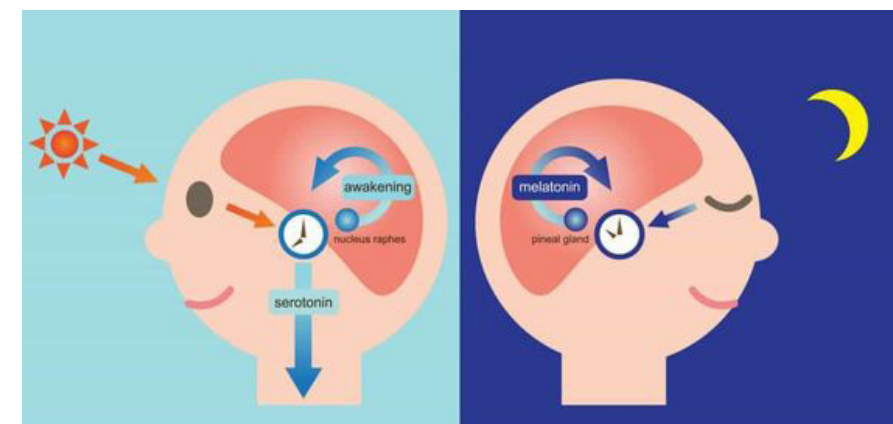
[35] <https://www.alz.org/help-support/caregiving/stages-behaviors/sleep-issues-sundowning>

Melatonin is a hormone that regulates sleep-wake cycles. [36] It is primarily released by pineal gland. It is a fact that modern people are the only organism that deviates from their normal rhythm and reverse day and night, and it is also true that the older we get, the smaller the amount of nightly melatonin production becomes. Because of this, the nightly signal becomes shorter, which is a change that is passed on to the entire body. Often the signal is not activated until long after midnight. However, the secretion of hormone ceases punctually at daybreak. As a result, elderly people receive the sleep hormone for a time period that is far too short, making it less and less available. For older pineal glands, enough melatonin production in the night is no longer possible, even if the body finds itself in complete darkness. The pineal gland is supplied with large amount of vessels, which with age are pacificated, much like other regions of the body. Calcification can lead to a reduction of melatonin production and further a pronounced loss of sleep and disruption of circadian rhythm. [37]

Melatonin's main job in the body is to regulate night and day cycles or sleep-wake cycles. Darkness causes the body to produce more melatonin, which signals to the body to prepare for sleep. Light decreases melatonin production and signals to the body to prepare for being awake. Some people who have trouble in sleeping have low levels of melatonin. [38] Side effects from supplements are minimal at low doses for short durations. [39] [40] Side effects may include sleepiness, headaches, nausea and abnormal dreams. Although we know that melatonin has little side effects as a supplement, some experiments have found that taking melatonin causes some side effects for the elderly.

Melatonin can cause nausea, next-day grogginess, and irritability. [41] For the elderly, it can cause reduced blood flow and hypothermia. [42] Therefore, it is a safe and effective way to help produce melatonin in the body of AD patients through non-pharmacological treatment.

Through research, it has been found that changes in music and lighting can help people produce melatonin, which I will describe in detail below.



[36] Auld F, Maschauer EL, Morrison I, Skene DJ, Riha RL (August 2017)

[37] <https://www.chronobiology.com/melatonin-chronobiology/melatonin-production-age/>

[38] <https://www.webmd.com/vitamins/ai/ingredientmono-940/melatonin>

[39] Auld F, Maschauer EL, Morrison I, Skene DJ, Riha RL (August 2017)

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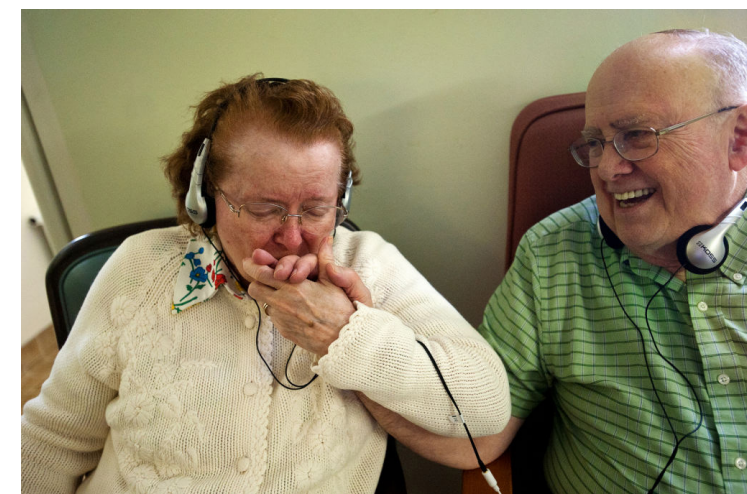
5.3.1 Music

Music has been described in various cultures as having healing effects and is being increasingly used as a clinical intervention to reduce the effects of stress and improve quality of life. Recent studies show that background music is effective for releasing tension and alleviating pain from specific areas of the body. It has also been reported that music enhances the therapeutic effect of drugs and acts as a catalyst during psychotherapy.

Among AD patients who are debilitated by many impaired functions including cognitive deficits, anxiety and aggressive behaviors, music has been described as having beneficial effects on specific behaviors. Among AD patients, music therapy strategies involve singing and drumming, and can decrease aggressive outbursts, agitation and anxiety, increase positive affect, stimulate more facial movements than do stimulation with touch or object presentation, and improve perceptual, motor and verbal skills. When combined with movements or exercise, music therapy has been found to improve oral expression among AD patients.

Until recently, studies related to the healing effects of music have focused primarily on analyzing changes in behavior and some physiological responses. In a study in 1980, however, Goldstein suggested that the feeling of tingling or "thrills" in response to music was caused by the release of endogenous opioids because the response was blunted by injection of naloxone hydrochloride, an opioid receptor antagonist. Recent investigations on music therapy for stress and behavioral modification is shifting toward direct measurement of changes in stress-related hormones such as cortisol, and there are reports about night shift in the following weeks. Norepinephrine and epinephrine levels increased significantly after 4 weeks of music therapy but returned to pretherapy levels in the following 6th weeks. Serum concentration of prolactin and platelet serotonin remained unchanged after 4 weeks of music therapy and in the following weeks.

Therefore, we can conclude that elevated levels of melatonin after music therapy may help patients relax. [43]



[43] Altern Ther health Med. 1999;5(6):49-57

5.3.2 Light

Alzheimer's disease and related dementias (ADRD) can cause sleep and behavioral problems that are problematic for ADRD patients and their family caregivers. Light therapy has shown promise as a nonpharmacological treatment, and preliminary studies demonstrate that timed light exposure can improve nighttime sleep efficiency, increase daytime wakefulness and reduce evening agitation without the adverse effects brought by pharmacological solutions.

Taking the American elderly with dementia as an example, while individuals with ADRD have similar sleep problems as healthy elderly people, they tend to show more random patterns of rest and activity than healthy and elderly adults. [44] The random patterns of rest and activity, along with related nocturnal wandering, is one of the main reasons why individuals with ADRD are transitioned from home to more controlled environments.

Light is not just for vision. Light reaching the retina contributes not only to visual perception but also to nonvisual responses, such as the resetting of the biological clock. Humans have a biological clock located in the suprachiasmatic nuclei (SCN) that generates and regulates circadian rhythms, which are biological rhythms that repeat themselves approximately every 24 h. These include cycles such as sleep and wake, body temperature, hormone production and alertness. The daily light-dark pattern reaching the retina is the main input to synchronize the biological clock to the solar day. If humans are not exposed to enough light of the right spectrum for long time, the biological clock becomes desynchronized with the solar day and humans may experience decrements in physiological functions, neurobehavioral performance and sleep [45] [46] [47] [48]

A person is more likely to experience a good night of sleep when the circadian and homeo-static systems, both of which influence the sleep-wake cycle, are aligned. Sleep pressure increases with time awake, contributing to high sleep need at night. The circadian system sends an alerting signal to the body during the day, counteracting the increase of sleep pressure with time awake and a sleeping signal during the night, promoting a consolidated night of sleep. The circadian clock consolidates sleep and wake periods in part by driving two 'gating' zones: the wake maintenance zone, which occurs approximately 2-3 h prior to habitual sleep onset, and the sleep maintenance zone, which occurs approximately 2-3 h prior to habitual wake onset, close to the minimum core body temperature [49] [50] Another very well-known circadian rhythm is the cycle of melatonin production. Melatonin is a hormone produced by pineal gland at night and under conditions of darkness.

[44] Hatfield CF, Herbert J, Van Someren EJ, Hodges JR, Hastings MH. Disrupted daily activity/rest cycles in relation to daily cortisol rhythms of home-dwelling patients with early Alzheimer's dementia. *Brain* 127(Pt 5), 1061-1074 (2004).

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For diurnal species, such as humans, melatonin signals that it is time to sleep[51] The timing of melatonin onset in the evening, referred to as dim light melatonin onset (DLMO), occurs approximately 2 h prior to natural bedtimes, and is used as a marker of the circadian clock. [52]

Light-sensitive retinal ganglion cells involved in circadian rhythm light transduction, which is how the retina converts light signals into neural signals for the biological clock. [53] It is now known that lower levels of light, less than those originally demonstrated in the 1980s, can acutely suppress nighttime melatonin production and affect the timing of melatonin onset and offset; however, light levels needed to affect melatonin are still higher than those needed to affect vision. [54] [55]

For example, a warm color (correlated color temperature of 2700 K or lower) nightlight delivering 1 lux to the cornea will allow one to safely navigate in a space at night, but it will not suppress hormone melatonin.[56]

Design considerations

- Light–dark patterns reaching the back of the eye set the timing of our biological clock and synchronize us with the local time on Earth. Lack of synchrony or circadian disruption, can lead to sleep disturbances, depression and anxiety, among other maladies.
- Elderly people, including those with Alzheimer’s disease and related dementias (ADRD), may show reduced neuronal activity in the biological clock that governs circadian rhythms, along with reduced light reaching the back of the eye due to physiological changes in the aging eye.
- Lighting characteristics that are required to affect the circadian system are different from those that affect vision. The circadian system is a ‘blue sky’ detector and needs higher amounts of light than those required for visibility.

- Circadian sleep disorder leads to fragmented rest–activity patterns, resulting in more frequent naps during the daytime and reduced sleep at night, increased irritability and increased depressive symptoms.
- Elderly people typically receive dim, constant light during waking hours. Light therapy, delivering high circadian stimulation during the day (circadian stimulus >0.3 or >400 lux at the eye of a bluish-white light) and low circadian stimulation during the night (circadian stimulus <0.1 or <50 lux at the eye of a yellowish-white light), can help to deliver a robust light–dark pattern to them. At a minimum, provide high light levels (e.g., sitting outdoors or by windows) for at least 2h in the morning to increase circadian stimulation. People sleep in darkness, and nightlights delivering low and warm color lights can be used to assist in navigation to the bathroom.
- Add new lighting delivering high circadian stimulation to spaces where people spend the day, such as the dining room.

Sleep is a very important human behavior that is related to the physical and mental health of AD patients. As an important place for the body to relax, the bathroom should help AD patients to solve sleep disorders during the bathing process. According to the above research, it is not difficult to find out how to establish the connection between space and sleep. The rational use of these elements in project design is the key that we need to continue to explore.

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CASE STUDY

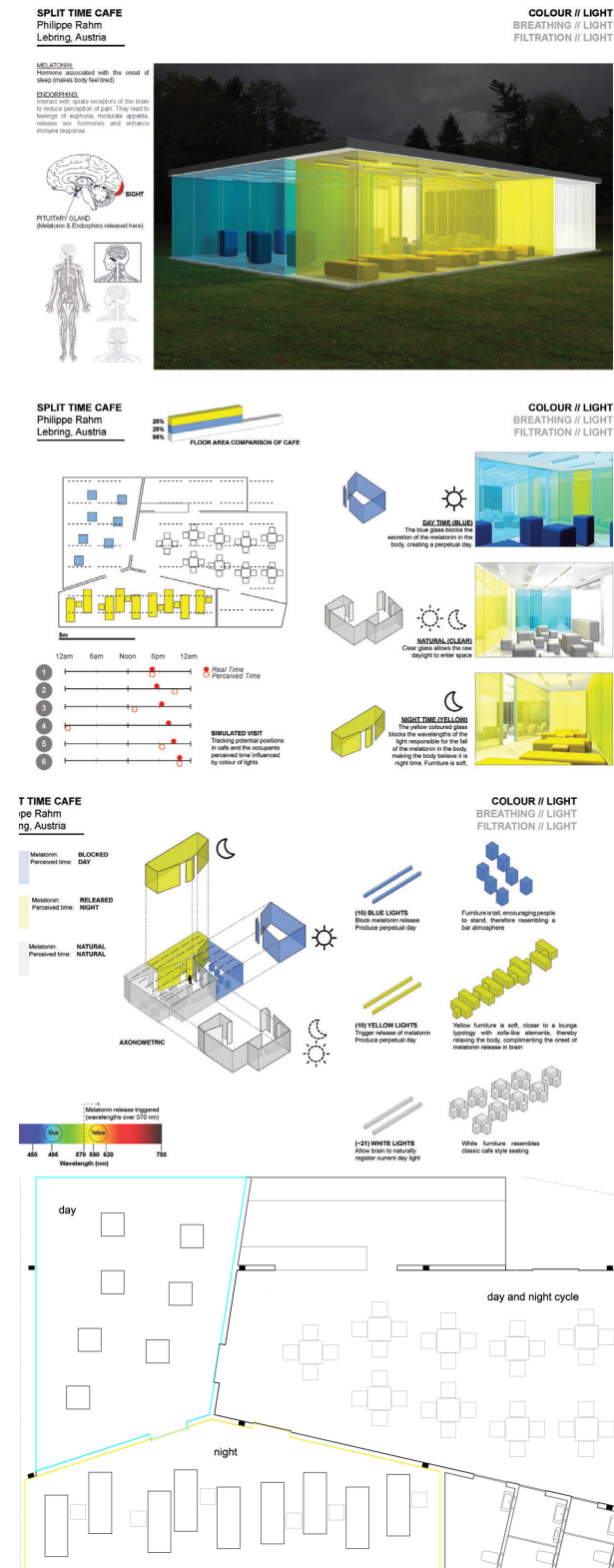
SPLIT TIME CAFÉ

Architecture becomes not only the design of the space but of the time too. To construct a night, to construct

a day: it becomes challenging possibilities for the architectural design. "Split times café" is an architectural project

splitting the time in three parallel spaces and customers could shift instantly from one moment of the day to an other.

Architecture becomes a time-machine, permitting to cross the time, to pass instantly from the day to the night, to shift from the naturalness to the artificial in a fragment of second. Architecture is here literally the art of the construction of time. The first temporality, taken in an envelope of clear glass, is, in real time, the time of the natural solar course. An envelope of blue glass defines the second temporality. The wavelengths of this blue light block the secretion of the melatonin in the body. It is therefore a kind of endless day. The third temporality is built with a yellow colored glass envelope, blocking the wavelengths of the light responsible for the fall of the melatonin in the body. It reproduces a true physiological night while being luminous like a day. The furniture choice is consequently in association with these temporalities.



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6 Therapeutic Intervening Measures of Alzheimer's

6.1 Alzheimer's Pharmacological

As Alzheimer's develops, brain cells die and connections among cells are lost, worsening cognitive symptoms. While current medications cannot stop the damage to brain cells, they may help lessen or stabilize symptoms for a limited time by affecting certain chemicals involved in carrying messages among the brain's nerve cells.

The US Food and Drug Administration (FDA) has approved two types of medications — cholinesterase inhibitors (Aricept, Exelon, Razadyne) and memantine (Namenda) — to treat cognitive symptoms (memory loss, confusion, and problems with thinking and reasoning) of Alzheimer's disease.



Medications for early to moderate stages

All prescription medications currently approved to treat Alzheimer's symptoms in early to moderate stages are from drugs called cholinesterase inhibitors. Cholinesterase inhibitors are prescribed to treat symptoms related to memory, thinking, language, judgment and other thought processes.

Medications for moderate to severe stages

Memantine (Namenda) and a combination of memantine and donepezil (Namzaric) are approved by the FDA for treatment of moderate to severe Alzheimer's.

Memantine is prescribed to improve memory, attention, reason, language and the ability to perform simple tasks. It can be used alone or with other medicines treating Alzheimer's. There is some evidence that individuals with moderate to severe Alzheimer's who are taking the cholinesterase inhibitor might benefit by also taking memantine. A medication that combines memantine and the cholinesterase inhibitor is available.

Researchers are looking for new ways to treat Alzheimer's. Current medications help mask the symptoms of Alzheimer's, but do not treat the underlying disease or delay its progression. Several promising drugs are under development and testing as researchers strive to discover a breakthrough to treat the underlying disease and stop or delay the cell damage that eventually leads to the worsening of symptoms.

6.2 Alzheimer's Non-drug Treatment

Despite of achievements made through arduous efforts, and a better understanding of clinical manifestations, risk factors and treatments in the field of AD and related diseases, there is lack of a clear knowledge of the pathogenic mechanisms, thus seriously affecting pharmacological and non-pharmaceutical Intervention. Significant progress has been made in new drugs which are newly put on the market and are in the testing stage, but it is only limited to field of old cholinergic hypothesis, of which only part of the efficacy can be expected. Therefore, non-pharmaceutical methods are crucial. Even if effective drug treatment can be achieved in short time, non-pharmacological interventions. [57] They are also necessary to address various clinical aspects of AD and related diseases - cognition, function, behavior and emotion. So, we need to understand what non-drug treatment is.

- Cognitive Behavioral Therapy - may be useful to assist with adjustment to the initial diagnosis and forward planning, and depression treatment in early-stage dementia. These interventions may be particularly useful for initial diagnosis.
- Psychotherapy and Psycho-educational Interventions - may assist caregivers in caring patients with dementia and in turn maintain their own wellbeing.
- Behavioral Management Therapy - may be useful for targeting challenging (difficult to manage) behavioral patterns of persons with dementia. Such behaviors may include wandering, agitation and repetitive questioning.

- Environmental Approaches/Modification - encourage creative solutions to dementia symptoms, targeting the environment of people with dementia. The ideal environment for patients with dementia is non-stressful, constant and familiar.
- Dementia Support Groups - can help develop useful and supportive networks and provide support services if needed. There are many Dementia Australia career support groups available for assistance.
- Montessori Activities - focuses on fostering the independence of people suffering memory loss through meaningful activities, roles and environmental cueing.
- Memory Training and Using External Memory Aids - can help patients in the early stages of dementia to improve their cognitive functioning and independence.
- Alternative Therapies - light massage and aromatherapy, music and dance therapy, animal assisted therapy, multi-sensory therapy.

As an interior designer, I need to figure out how to combine non-pharmacological treatments such as aromatherapy and music therapy to create a place that can help with non-pharmacological treatments. As with the environmental treatments mentioned above, a non-stressed and constant space is critical for patients.

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6.2.1 Sauna Therapy

Although there is a direct correlation between ageing and the incidence of dementia, its risk factors and pathogenesis are not fully understood, and various possible preventive strategies are still under investigation. A multifactorial etiology has been proposed and pathways notably implicated include inflammation, hemodynamic and vascular function. [58] [59] Evidence from observational studies suggests that poor vascular function (as indicated by arterial stiffening) and vascular diseases may be associated with worse cognitive performance and dementia. [60] [61] [62] Given this, there remains a possibility that improved circulatory function may be linked to better cognitive outcomes. Sauna bathing, an activity contributing to relaxation and well-being, can improve hemodynamic function and skin sweating which induces fluid loss and increase in heart rate. [63] [64] and it also has been suggested to be associated with a better cardiovascular and circulatory function, especially among patients with chronic heart failure. [65] [66] [67] [68] [69] Previous studies have also shown that heat exposure of sauna bathing is associated with lower blood pressure. [70] [71] however, some of these reports were based on limited study designs. We have recently confirmed that regular sauna bathing is associated with reduced risks of fatal cardiovascular diseases and all-cause mortality. [72] However, the relationship between sauna and dementia is unclear. Therefore, the author studied a Finnish prospective study to find out the relationship between the frequency of saunas and the risk of dementia and Alzheimer's disease.

In a population-based study of middle-aged Finnish men, people found a strong inverse association between the frequency of sauna bathing and the risk of dementia and Alzheimer's disease, which was independent of known risk factors.

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Although the pathogenesis of dementia has not been completely elucidated, current evidence suggests that a multi-factorial etiology, such as impaired cardiovascular function, inflammation and oxidative stress, is the major contributor in its pathogenesis. [73] This result is therefore biologically plausible as regular sauna bathing is associated with improved vascular endothelial function. [74] which also leads to reduced inflammation. Additionally, sauna bathing may be beneficial to the reduction of high systemic blood pressure and elevated pulse pressure, which are also well-known risk factors for dementia. [75] [76]

During sauna bathing, skin blood flow usually increases, leading to a higher cardiac output with an increased body temperature. Heart rate may increase from 100 to 150 beats per minute during sauna bathing. [77] [78] [79] Although there is no active function of skeletal muscles during the sauna bathing, which contrasts with the training response experienced during physical activity. Indeed, it has been shown that weight loss achieved during intense physical exercise is more favorable for athletes than that achieved through the effects of sauna. [80] The increase in heart rate during sauna bathing is due to reaction to the heat stress.

Overall, these results indicate that sauna bathing, as a relaxing habit, remains a potential additional strategy which can be used for improving cardio-vascular function. [81] and subsequently prevent or delay the development of neurogenerative diseases such as dementia.



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CASE STUDY

QC TREME

Located near Mont Blanc, the sauna and lounge design, the designer uses natural materials to help guests rest after using the spa. The design of the Haiyan sauna room and the aromatherapy lounge are introduced here.

SAUNA LAVENDER

Immerse yourself in the aromas of lavender, enjoying its fragrance and benefiting from its relaxing and decongesting properties , Chamomile and lavender help relax nerve tension by breathing

benefits

clears your airways | stimulates circulation

SALT ROOM

benefits toning effect frees your lungs

salt scrub

Treat yourself to this scrub treatment to cleanse your skin from toxins and impurities, leaving it smooth and radiant .

take a small amount of salt and relax for 10 minutes



6.2.2 Aromatherapy

Current treatments include the use of neuroleptics, which are often associated with adverse side-effects and might worsen the disease process.[82] [83] [84] Antidepressant, antipsychotic and analgesic medication can be effective for depression, delusion or pain. Antipsychotic medications are preferred by most psychogeriatricians to manage symptoms of psychosis, aggression and agitation,[85] but their efficacy and safety are not conclusive. [86]

Non-pharmacological intervention, such as cognitive training brain gyms and cognitive behavioral technique (CBT), might not be applicable to patients with moderate to severe dementia, as they might not be able to obey simple instructions or understand abstract thinking.

There has been an emerging global trend on the use of complementary and alternative medicine (CAM). The National Center for Complementary and Alternative Medicine defined CAM as "a group of diverse medical and healthcare systems, practices and products that are not presently considered to be part of conventional medicine". Some examples are hypnotherapy, acupuncture and herbal medicine. [87] [88] [89] Among them, aroma-therapy has long been used for the treatment of BPSD to improve sleep,[90] [91] and facilitate desirable behaviors. Holmes et al. stated that lavender essence oil is a non-invasive and yet beneficial method for treating agitated behavior in clients in late-stage dementia, because of its sedative qualities on inhalation.

Aromatherapy is the use of essential oils (EO) to affect the brain and body. EO enter the bloodstream and react with hormones and enzymes, causing a physical reaction in the body. Lavender has been postulated to exert a direct action on tryptophan, the precursor of serotonin, which helps put people to sleep. [94] Through pharmacokinetics, EO are absorbed into the body through digestion, lining of orifices, olfaction and the external skin. [95]

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Hypothalamus and thalamus, which make up diencephalon, are involved in such aspects of behavior, as motivation and emotion. These brain structures regulate other body activities through exerting control on the neuroendocrine system and autonomic nervous system. With these pathways, aromatherapy EO can mediate our emotional responses by inhalation alone. Despite the remarkable increase in the use of aromatherapy, data supporting efficacy are scarce. A positive result of its effect on anxiety was shown in a systematic review.

Aromatherapy is the practice of using natural oils to enhance physical and psychological health. Recent studies have shown that the use of aromatherapy on patients with Alzheimer's disease can improve cognitive function without any negative side effects. Natural essential oils have been used for centuries as relief for anxiety, depression, insomnia, and stress. Today, these oils are found to do so much more. Alzheimer's patients who underwent aromatherapy experienced boosts in memory and increase of mood. Before we use aromatherapy, it's crucial to know what oils to use and how it works. [96]

[96] <http://autumngrove.com/aromatherapy-for-alzheimers/>

1. Lavender

Lavender is thought to have calming effect and able to balance mood swings. It has also been used to help with depression, anger and irritability, and can help in some cases of insomnia. Lavender can be directly inhaled, used as a massage oil or sprayed on linens.

2. Peppermint

Peppermint is an energizer and can be used to stimulate the mind and calm nerves at the same time. Best used in the morning, peppermint oil can be inhaled directly, diffused in a room, used as a massage oil, sprayed in the air or even placed in a bath.

3. Rosemary

Similar to peppermint, rosemary is an uplifting oil used for stimulating the mind and body. It may even improve cognitive performance and mood. Rosemary has also been known to ease constipation, symptoms of depression and also reinvigorate the appetite. Rosemary oil can be directly inhaled, diffused in a room or used as a spray.

4. Bergamot

Bergamot can be used to relieve anxiety, agitation, mild depression and stress. This mood elevating and calming oil can also be used to relieve insomnia. Bergamot oil can be dripped in a bath, used as a massage oil, diffused in a room or used as a spray on clothing or linens.

5. Lemon Balm

While lemon oil may be among the more expensive oils, studies show that it is also one of the most effective oils. It has been shown to help calm and relax people who are dealing with anxiety and insomnia, improve memory and ease indigestion. Lemon oil can be dripped into a bath, inhaled directly, diffused, sprayed or applied directly to the skin as a massage oil.

6. Ylang Ylang

Ylang Ylang oil can help ease depression while promoting good sleep. This is a great oil not only for a person living with Alzheimer's, but also for caregivers struggling with restlessness and lack of sleep. Ylang Ylang is often combined with lemon oil and can be placed in a bath, inhaled, diffused or sprayed.

7. Ginger

Ginger oil is helpful for anyone struggling with digestion issues. Commonly used to treat a loss of appetite and constipation, ginger can help promote good eating habits. Ginger oil can be applied directly to the skin as an abdominal massage, inhaled, diffused, sprayed or placed on a compress.

With the above introduction, we can know that the proper smell can help the patient to relieve the mood and reduce the vigilance effect, and the smell is the deepest memory of human beings. Some familiar tastes may evoke some memories, such as the fragrance of cinnamon apple pie made by childhood mother. Adding these relatively soothing and relaxing odor elements to the project can help the patient with a richer non-drug treatment while completing basic functions.

6.2.3 Music therapy

Music therapy is a type of intervention that involves music in some capacity and includes both a participant and a therapist who has completed an accredited music therapy program.[97] [98]The forms of music therapy are broad in nature, and can range from individual or group singing sessions, to active participation in music making, to listening to songs individually. [99] For those populations living with Alzheimer's, music therapy is becoming a widely used way to assist in alleviating the behavioral and psychological symptoms of this disease.[100] [101]Music therapy is based on scientific findings and can trigger change in individuals as well as groups through music. [102] Personalized music therapy has been shown in some cases to be able to lessen certain symptoms, including behavioral symptoms and those related to dementia.[103]Music therapy, in comparison to pharmacological treatments, is a very low-cost solution to help manage aspects of the disease throughout the progression of the disease.

Many research studies, as well as anecdotal evidence, have cited situations where music are able to evoke a response or a memory in people with Alzheimer's. For example, your mother may have difficulty finding the right words to use but be able to sing an entire song with no problem.

One research project which studied people with Alzheimer's found that their memory for music was not affected by the disease: they performed similarly to those without Alzheimer's in recognizing songs and lyrics. Although that's certainly not true for everyone with dementia, I've seen numerous people who could play complete songs on the piano or sing every word to an older song, even as they were well into the middle stages of Alzheimer's and could not remember the names of their family members.

These lasting memories of music are likely an important factor in understanding why its use to treat and interact with those who have dementia can be beneficial. Research studies have demonstrated that music is an effective way to provide meaningful activities, reduce challenging behaviors, and decrease feelings of anxiety and depression in AD patients. Many of us enjoy and benefit from listening to music, and this often does not change after someone develops Alzheimer's.

The use of a comprehensive therapeutic function of music is purposefully and systematically applied to the rehabilitation and functional improvement of Alzheimer's disease.

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- **Appreciation music therapy**

Let the patient listen to or watch the music recorded in advance, opera or live music, and listen to the music in the way of causing the patient's physical, psychological, cognitive, spiritual, emotional and other changes, so that the mental and nerve of the sick. The system is adjusted for therapeutic and rehabilitation purposes. Patients may develop imagination, free association, physiological relaxation, and behavior during or after listening and viewing. The discussion of lyrics, triggering memories, creating stories, emotional catharsis, and behaviors. The patient can choose some elegant and lively music according to the needs of treatment and his ability to appreciate music, and choose some elegant and lively music every day. He listens and closes his eyes and listens to the music, and tastes the artistic conception of music and depiction.

- **Musical Somatosensory Vibration Therapy**

Mr. Komatsu Akira, director of the Japan Music Therapy Alliance, began research on transducers in 1960, conducting academic research and product development of somatosensory sound, and incorporating somatosensory sound technology into music therapy, creating a precedent for Japanese music somatosensory vibration therapy. At present, some general hospitals in Japan have adopted music somatosensory vibration therapy, which is used in the clinical treatment of insomnia, depression, irritable bowel syndrome, bulimia nervosa, anorexia and other psychosomatic or physical and mental diseases. Blood transfusion, surgery, hemodialysis and senile dementia, constipation and prevention of hemorrhoids have achieved good results.

- **Music massage therapy**

Music is also a very effective physical therapy. Music acts on the treatment part in the form of a pulse current, which is a collection of low-intermediate- frequency currents, a special pulse current with a complex waveform of musical laws. The pulse current of music has a certain regularity and is ever- changing. It is like the various methods of acupuncturists. The pulse current at each moment is a new stimulus to the human body and thus does not adapt. The music signals act on the auditory organs and acupoints of the human body respectively, achieving the purpose of similar or even superior to the traditional electroacupuncture therapy while avoiding its shortcomings. People like to call this therapy "a pleasant natural therapy" or "music massage therapy." At present, there are various types of music electric therapy instruments, among which two kinds of national patented new music therapy instruments - Kang Jian music therapy instrument, have four therapeutic functions of music, image, electric therapy and hyperthermia. During the treatment, the rhythm, melody, and visual stimulation of the music are integrated with the local current stimulation and the warming effect, and simultaneously act on the patient. It is used to treat physical and mental diseases. While improving the local symptoms of patients, it can relax the body and mind to the maximum extent, improve the mental health of patients, and have the unique curative effect of both physical and mental treatment.

Music in Early-Stage Alzheimer's

In the early stages of Alzheimer's, many patients enjoy playing music or singing. It is necessary to encourage them to continue to be involved in music; there may be an area in which they can feel success and accomplishment and be encouraged by its beauty.

You can also make compilation recordings of their favorite songs, which are often songs or music that date back to their younger and middle years. Some older adults may have strong spiritual beliefs and will appreciate songs of faith.

Music in Middle-Stage Alzheimer's

Some people in the middle stages of Alzheimer's can continue to play the piano (or whichever instrument they may have played) well, and benefit from it. Others may become frustrated when they forget the chord or can't read the music.

In the middle stages when behaviors can sometimes be challenging, music is an often effective way to distract them. A nurse aide that I know, for example, almost always sings a song with the person she's helping while they walk together. The person walks farther because he's singing along and has a more enjoyable time getting his daily exercises accomplished.

Music may also be beneficial to mood and sleep well-being for people with Alzheimer's. A study published in the journal *Alternative Therapies in Health and Medicine* was conducted with 20 male residents who had been diagnosed with probable Alzheimer's at a nursing home. These men participated in music therapy five times a week for four weeks. Following the four weeks, their melatonin levels were tested and had significantly increased and remained elevated even six weeks after the conclusion of the music therapy programming. Therapists also noted that the men demonstrated an improved ability to learn the songs and lyrics, increased social interaction, and a more relaxed and calm mood.

Music in Late-Stage Alzheimer's

In the later stages of Alzheimer's, music is often used for connecting with a loved one and evoking a response. People may enjoy listening to the recordings of their favorite songs, which you made in the earlier stages of dementia.

Familiar music may be able to calm someone who's restless or uncomfortable in the end stages of life. Some people with severe Alzheimer's will mouth the words of a familiar song upon hearing it, and visibly relax and rest amid music.[104]

[104] <https://www.verywellhealth.com/using-music-in-alzheimers-disease-97624>

The role and significance of music therapy

Music as a switch for people's memory is now more often used in interior design. At the same time, according to the above discussion, it is not difficult to find out that music is more important for AD patients than ordinary people. In our project, the sound element is a must.

With the influence of the growth of the elderly population in society, music psychology began to intersect with the psychology of the elderly, and gradually formed a new discipline in the intersection of the old-age spiritual musicology. For the elderly, music can bring strength to their lives. The physical discomfort brought by the old people along with the increase of age leads to a weakening of self-concept. When they participate in music collaboration, or play, or compose music, or go to accompaniment, or to appreciate, these problems will change, when the old people find that they are still creative and can learn new skills, Will have a sense of pride. When the old people can all exert their highest creative potential and actively participate in music activities, they can produce a sense of nostalgia for the happy times of the past and recall the happy times of the past. Every family has an old man, and everyone will grow old. Science has confirmed that the decline of human brain cells is irreversible, and the existing scientific and technological means can not make the dead brain cells die and resurrect. However, scientific research and clinical practice have also confirmed that mastering the necessary knowledge and taking active preventive measures can reduce the incidence of Alzheimer's disease and improve and alleviate the clinical symptoms of Alzheimer's disease. Music therapy is a very beneficial form of treatment and delaying aging.



CASE STUDY

MUSIC THERAPY WITH DEMENTIA

NAU PUBLIC HEALTH STUDENTS - 2015

Undergrad capstone for NAU public health students Katie Reed, Kelsey Adams, Alyssa Trinidad, and Cassidy McAfee. This was a health promotion program that used music therapy with dementia and Alzheimer's patients to increase emotional wellness and memory recall.

At the beginning of the video, the girl asked the old woman some questions about her childhood. Her answer is incoherent and even indifferent. When the girl handed her the earphones, the old woman said with some anxiety that "what's going to which song you got?" The girl appeased her and said "the good one, only good song". As she enjoys the song, her face begins to smile and sometimes clapping. Then when the girl asked questions about childhood before the question again, the old woman seemed to open her heart, and she was more willing to share her story with the girl.



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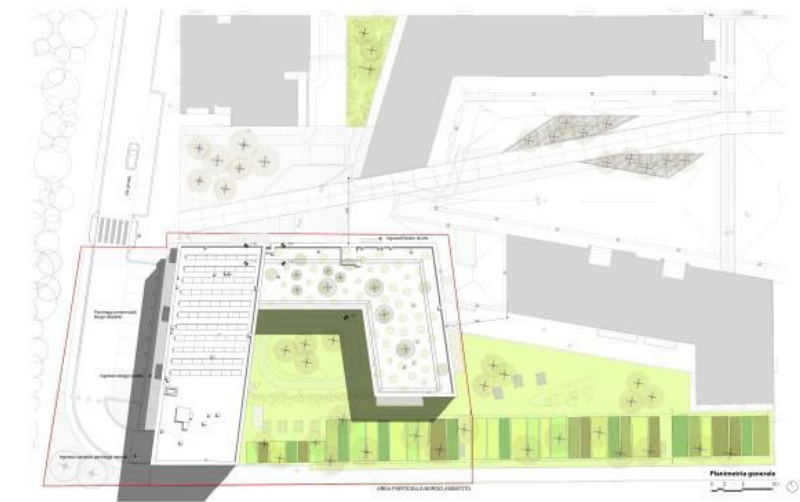
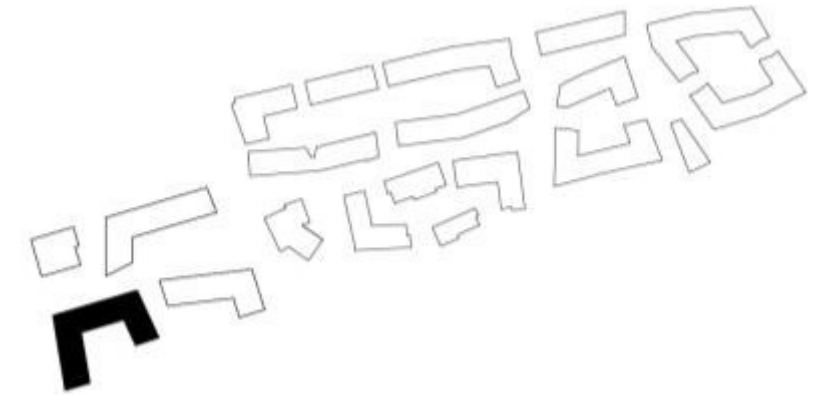
So far, the research and investigation of AD treatment has temporarily ended. Through the study of interventional therapy for Alzheimer's disease, we learned that due to the limitations of drug-based treatment, non-pharmacological treatment is suitable for Alzheimer's disease. Researchers are vital, and for the family, caregivers are also important. At the same time, we can find that most of these non-pharmacological treatments can be combined with indoor space, which needs to be taken seriously as a carrier of human behavior. The author hopes that through the above research, we can find some ways to connect space and non-drug treatment. By using these methods, we can begin to conduct in-depth research on the project and use these methods to try to create a more comfortable bathroom, thus helping AD patients solve mental and physical aversion to bathing.

7 Sauna Bath's benefits for AD patients

7.1 Status of the Figino Day Care Center

The number of residents of Figino is 1,598, and the population consists mainly of the elderly population. At the same time, the commuter workers around Milan, the retired old people and the marginal residents in the low-end of society, and the demented disabled who lost their social life ability gather in Figino. The proportion is much higher than the surrounding. There are 681 families living in the area, with an average of 2.4 members, but the proportion of one family (usually living alone) is 32%; those without children are 19%, and those with children are 39%, most of them. Only one child. 55.1% of the residents did not work, mainly for the elderly over 65 and a small number of children.

The elderly center of the Figino community in Milan is located on the west side of the new town of Figino. After the completion of the construction, it is planned to stay in the dementia for the elderly in the nearby community and to enhance the vitality of this ageing community.



MASTER PLANE OF THE BUILDING OF FIGINO, MILAN, ITALY



MILANO FIGINO ARCHITECTURAL PLANE, ITALY

The first-floor layout is divided into three parts: the treatment part: health care workers and doctors provide medical care for the elderly with dementia. Day Care Center: Provides day care services for the elderly with dementia, bathing system, participation in fitness, lunch and rest activities, joint work hall.

As shown in the figure, the bathing system is included in the treatment section, which means that the bathing system is included in the treatment system in the initial design, rather than simply to solve the health problem. Therefore, it is more indicative that more treatments need to be emphasized in the bathing system to help patients get relief during the bathing process.



ROOM AND CORRIDOR SCENES IN FIGINO BUILDING

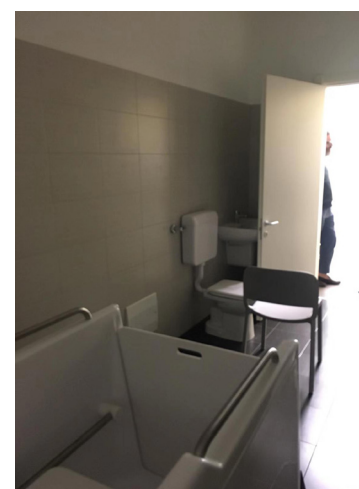
Through field research and architectural space analysis, it is concluded that the following problems exist in the community aged center bathing system:

1. Bathing empty Because of the small space, there is no design treatment function for patients.
2. The structure of the bathing space is too simple for patients to reluctant to enter.
3. Simple lighting allows the patient to see the shadows after entering.
4. The patient did not want to take off his clothes because of self-esteem.
5. Without the temperature adjustment function, the indoor temperature can not be maintained in a comfortable warmth, the patient will be afraid of the cold, and may cause a cold.
6. No treatment was added, contrary to the original intention of the bathing system in the treatment area.
7. The exhaust system is simple, and it is impossible to solve the bacteria growth caused by humidity problems in the bathing process and after bathing, which increases the workload of the caregiver.
8. There is no professional bathing equipment to help patients improve the quality of bathing.
9. The problem of wheelchair use caused by the small space makes the space have to be simplified.
10. There is no professional mobile device for the caregiver to help the patient enter the bathtub, which leads to an increase in the workload of the caregiver.
11. A single color does not make the patient aware of the danger.
12. Floor tiles can easily cause a patient to fall.
13. There is no smell in the bath space due to the absence of windows, and there is no solution to help improve air quality.

14. There is no space for the caregiver to safely store shampoo. Patients may eat shampoo and pose a threat to health.

15. There is no entrance design that draws the patient into the bathing space, making the patient resistant and unwilling to enter the bathing space.

16. There are no facilities that attract patients to reduce their excitement during the bathing process.



CASE STUDY

NEW JERSEY'S THE SHORES BATHROOM

Spa/bathing. For someone with dementia, the toileting and bathing experience can be stressful or overwhelming, and complex for caregivers to manage. Though there are many design guidelines for senior-friendly bathrooms, there are several specific recommendations for persons with dementia. For instance, providing a direct visual connection from the bed to the toilet may reduce incontinence and nighttime accidents. Additionally, bathing spaces should be as calm and peaceful as possible to alleviate anxiety, because many persons with dementia have a fear of bathing and water. This may include providing familiar-looking fixtures, soothing lighting, peaceful music or even aromatherapy. Spa/bathing rooms at United Methodist Homes of New Jersey's The Shores at Wesley Manor, Ocean City, N.J., are senior friendly, calming and include familiar-looking fixtures.



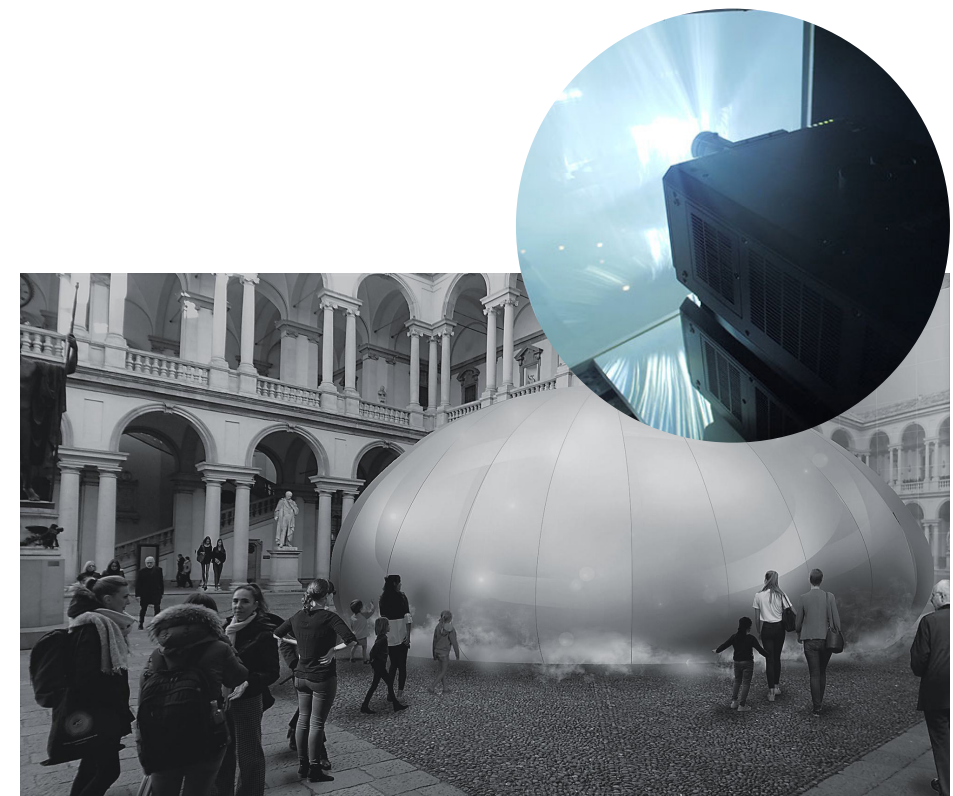
CASE STUDY

IMMERSIVE INSTALLATION

PANASONIC MILAN DESIGN WEEK 2018 BRERA

The immersive installation "Air Inventions" is the focal point of our exhibition - a huge "water-drop pavilion" in the courtyard of the Pinacoteca de Brera, home of the Brera Academy of Fine Arts. The installation showcases Panasonic's latest air-conditioning technology, allowing visitors to experience the cleanest, purest air in Milan.

In addition, Panasonic's imaging, audio, and lighting technologies help create a calming and welcome atmosphere away from the busy design fair environment. The concept is based on Panasonic's new creative philosophy of creating products and experiences that address more intangible elements of everyday life, such as wellbeing, feelings and experiences.





7.2 Introduction

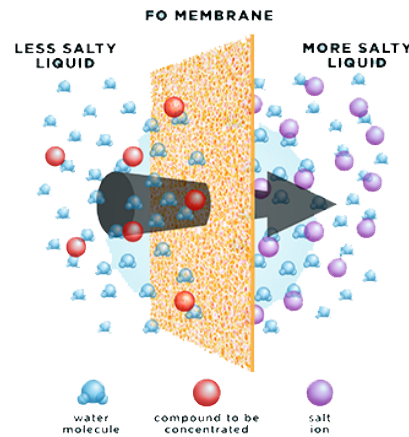
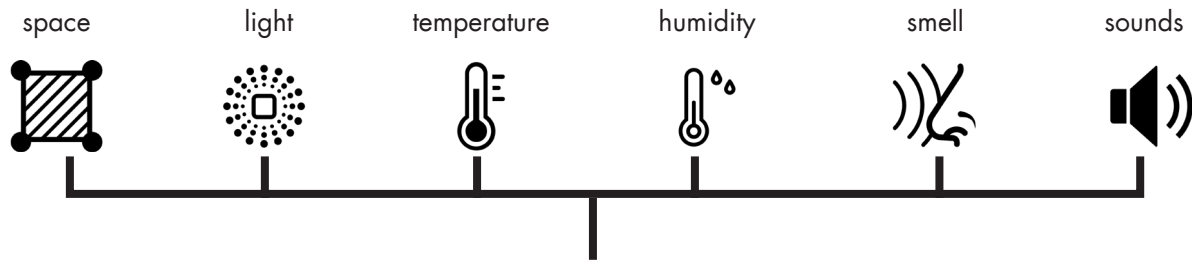
Designed to create a therapeutic bathing space in the figino Alzheimer Daily Care. Help patients to treat while solving health problems. I designed a space that contains multiple non-pharmacological treatments that can be flexibly adjusted based on the patient's use over the course of the day and year. At the same time, in order to solve the problem of small space, I adopted a variable spatial structure. Let the patient's bathing become a happy activity.

7.3 Concept

Osmosis is a phenomenon in which water molecules diffuse through a semipermeable membrane, and a region where water molecules are high diffuses to a region where water molecules are low. I hope that the concept of humidity is conceived **as a water molecule**, and the whole system gradually penetrates the **humidity** into the normal environment of Alzheimer's life through a gradual approach.

Because people with Alzheimer's disease lose more than just memory, and more about **the security of unfamiliar environments**, I hope that the instinctual physiological cognition of **light, smell, color, sound, and touch** will penetrate into the normal environment. This allows the patient to have a higher sense of security when entering the **spa system**.





- The walls of a building are like the cell walls of a cell. I want to build a space where water molecules can move freely. The bubble of the membrane structure is like a water molecule, passing through the wall, soft and smooth, breaking the icy feeling of the wall, becoming warm and bright.
- Another form of existence of water molecules is humidity. The humidity in the space from high to low is a process like osmosis, gentle osmosis from a low ground direction. The patient can feel the presence of water gently and slowly feel the moisture of the body from the air.
- The last form of water molecules exists in the body of water. As the temperature rises, the water in the body turns into sweat, and the dirt in the blood is discharged together. The temperature slowly rises, gently taking away excess water from the body.

BATHROOM USER



Caregiver

- Moving patients
- Endure complaints
- Hard to mediate patient emotions

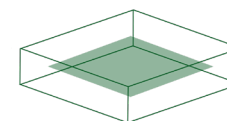


AD patients

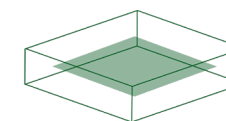
- Anxiety
- Excitement
- Forgotten
- Fear
- Fantasy
- Shame

Non-pharmacological treatment

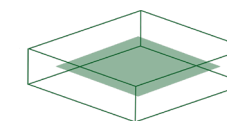
The project contains Aromatherapy, Music therapy, Light therapy, Sauna treatment, Four non-pharmacological treatments. Which solves the problem that the bathroom is located in the treatment area but no treatment facilities have been added.



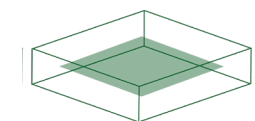
Aromatherapy



Music therapy



Music therapy



Sauna treatment

REASONS ALZHEIMER'S PATIENT MIGHT NOT WANT TO SHOWER

The reason why the elderly are unwilling to take a shower

We conducted some research to investigate why elderly people with Alzheimer's disease are reluctant to take a bath. We know that it is very important to help caregivers solve this problem.

Cultural problem

Many old people don't have the habit of taking a bath every day when they are young, and they don't even have a shower. In some areas, terme is the only way to take a bath. They do it once a week, like a bathing ceremony. Or only before there are important occasions.

Therefore, if the patient's world view is to take a bath once a week, they will not want to bathe frequently. But the problem is that because of the condition of Alzheimer's disease, they can't control their behavior and often make themselves dirty.

Worried about falling

There are chairs in the bathing spaces of some care centers, but it is inevitable that patients are still afraid of falling during the move. Unless the ground is very clean and there is no water, your feet can easily slip from your body and the patient's walk is not so stable.

modest

Let us be blunt, there is no really good way to solve the problem of modesty in the bath. You must be completely naked at once, and as a person with Alzheimer's disease, you rarely have the chance to take a bath alone. Yes, we can put a towel when he or she is naked, but it is a more difficult step for him to take off his clothes.

I don't know if i am dirty

When you want to tell the patient that he is dirty, the patient will try to cover up the dirty area and tell you that he is fine. They are not willing to admit that they are really dirty.

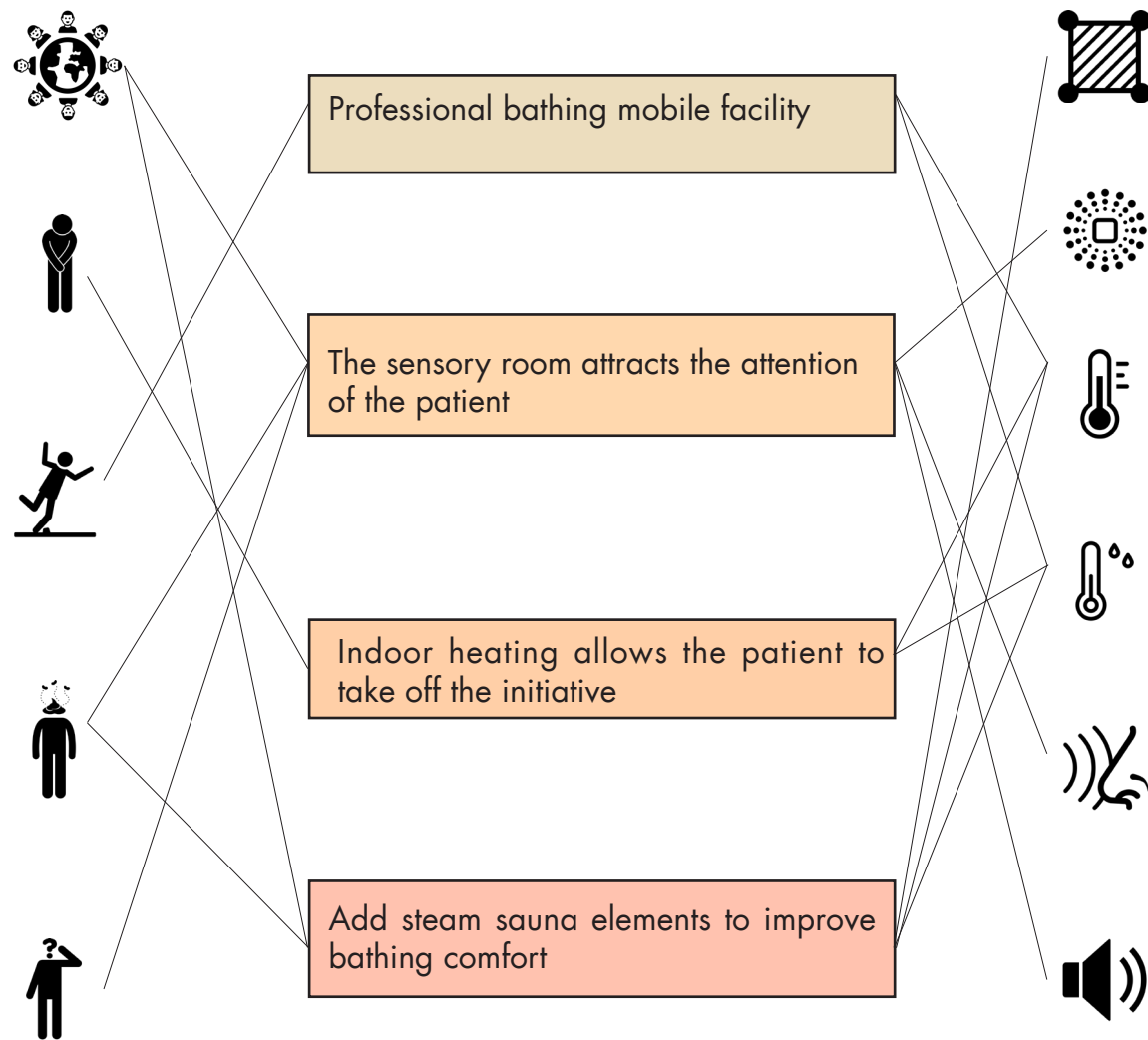
I don't remember how many days have elapsed since the beginning.

Some patients are still wearing gowns during the three days of Thanksgiving (sleeping during the day and night), and the caregiver has to remind him that the holiday has passed so many days. One difficulty with Alzheimer's disease is that they can't refer to time. They reset every 20 minutes without any reference frame.



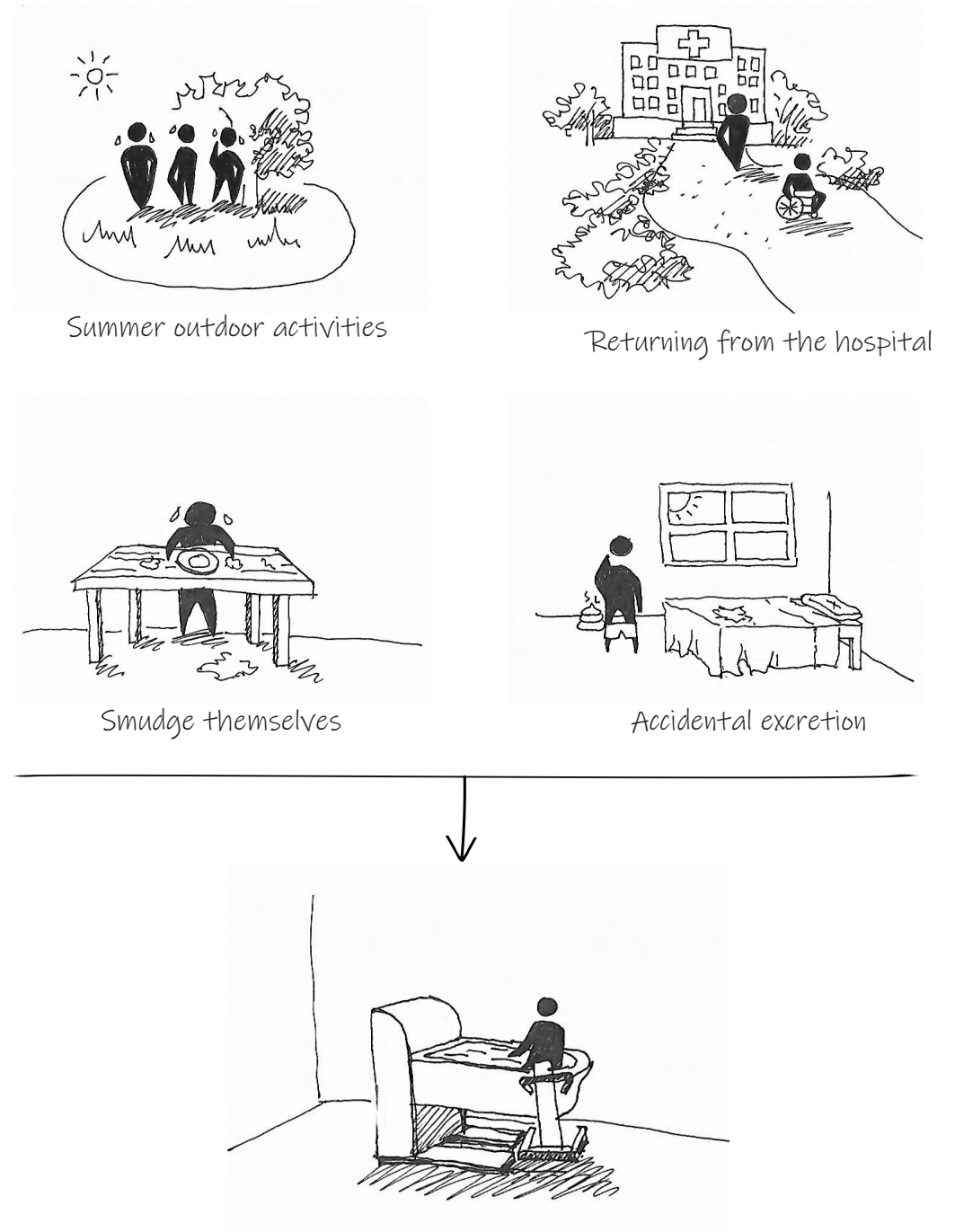
7.4 DESIGN STRATEGY

HOW TO MAKE AD PATIENTS NOT AFRAID TO BATHE



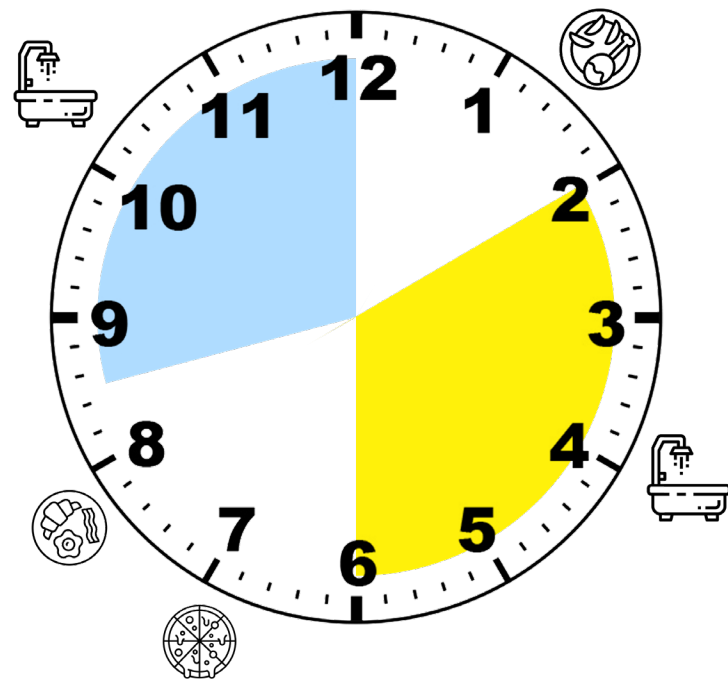
In order to solve the problem that the elderly are unwilling to take a bath, we have established four solutions, including the use of the class, the safety class, the respect of the class, and the improvement of the bathing quality class. At the same time, these four solutions combine the space, lighting and temperature mentioned above. , humidity, smell and sound.

BATH TIME FOR ALZHEIMER'S PATIENTS



In addition to the regular bath time, Alzheimer's patients still have a lot of time to bathe, which is added to the timetable.

BATH TIME FOR ALZHEIMER'S PATIENTS



DAILY CARE CENTER
OPENING TIME
8:00-20:00

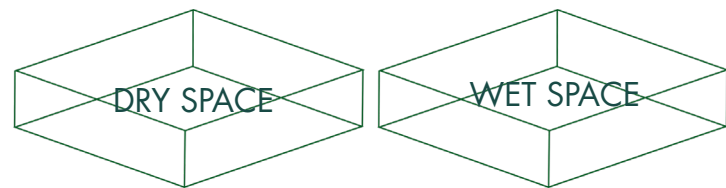
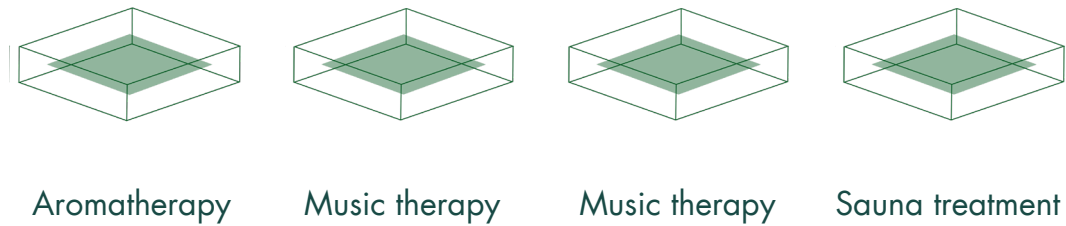
8:00-8:30 BREAKFAST
8:30-12:00 BLUE LIGHT BATHROOM USAGE TIME
13:00-14:00 LUNCH
14:00-18:00 YELLOW LIGHT BATHROOMM USEGE TIME
19:00-20:00 DINNER

The day care centre is open from 8:00 am to 8:00 pm and has three meal times per day. Since bathing before eating is not conducive to the health of the patient, and the caregiver also needs to prepare for the meal time, the use of the bathroom is stopped one hour before each meal.

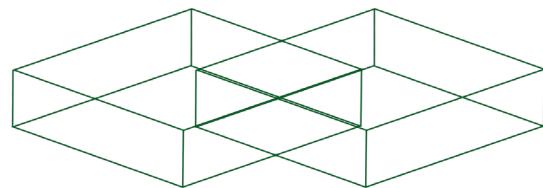
To help patients solve Sundowning problems, use different lights, sounds, and odors to adjust the patient's schedule, divided into morning and afternoon.

- Light: Blue light helps suppress melatonin secretion, reduces naps, and keeps you awake during the day. The yellow light helps patients secrete melatonin, trap them, and sleep better at night.
- Sound: The same sound arrangement as the light is equally divided into morning and afternoon, and happy music or music that evokes memories is used in the morning. Use natural sounds to calm the patient in the afternoon.
- Odour: Arranged at different times depending on the different effects of the fragrance. The scent of the lily in the morning makes the patient happy, and the afternoon lavender helps the patient calm down.

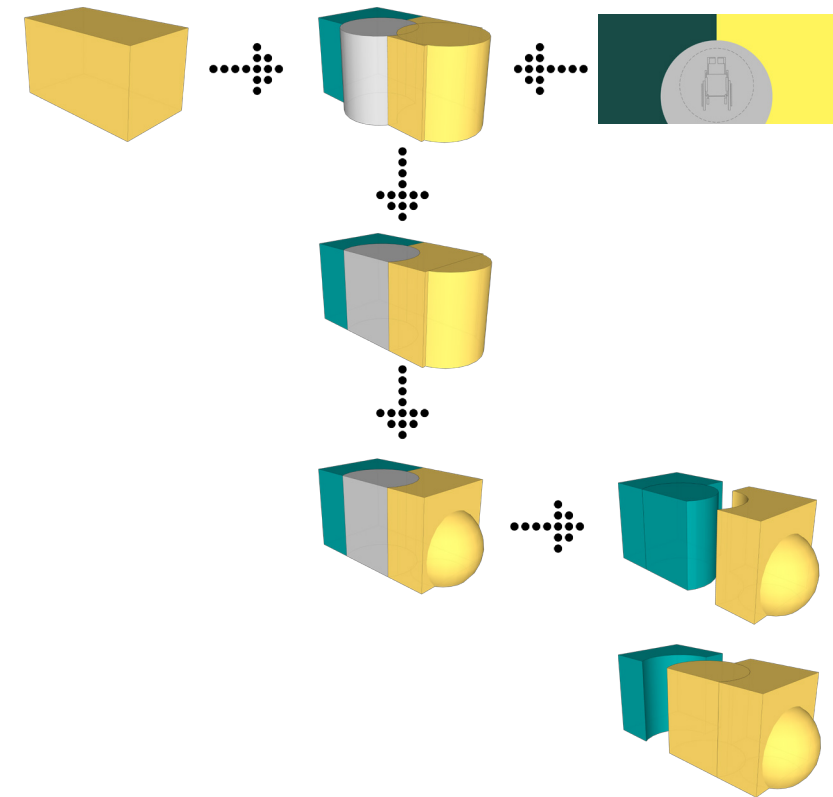
SHAPE EVOLUTION



CROSS TWO SPACES



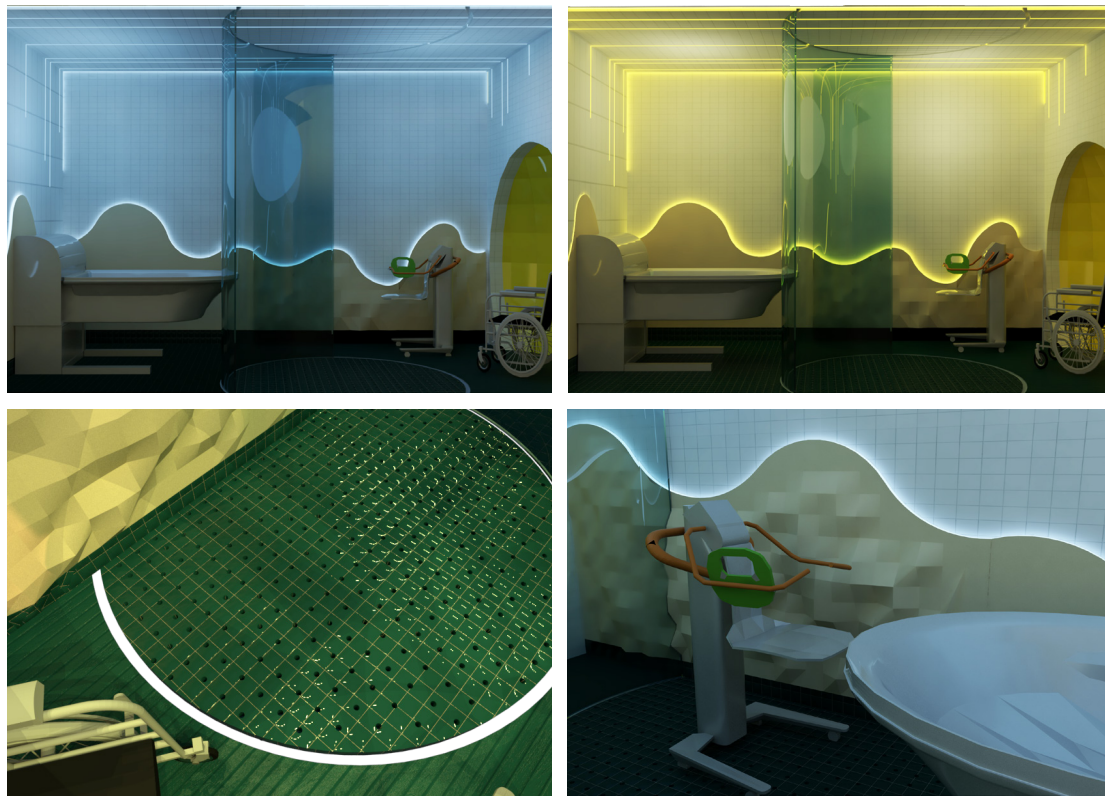
START POINT



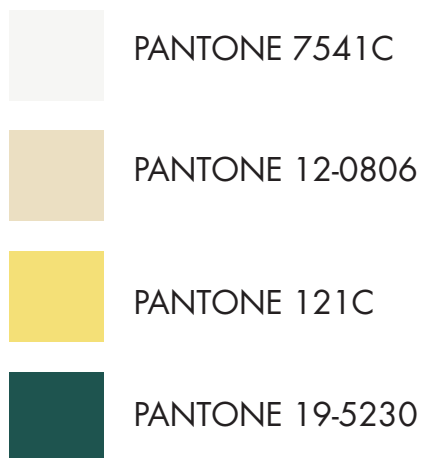
- The space is divided into three parts, dry space, wet space, and gray space.
- The gray space plane is set to a partial circle in order to move the movement path of the chair or the wheelchair.
- The entrance is set to simulate the effect of water molecules passing through the wall to attract the attention of the patient.
- The gray space is contained in the dry space or the wet space by the rotation of the glass moving door.

7.5 FUNCTIONS

COLOUR AND MATERIAL



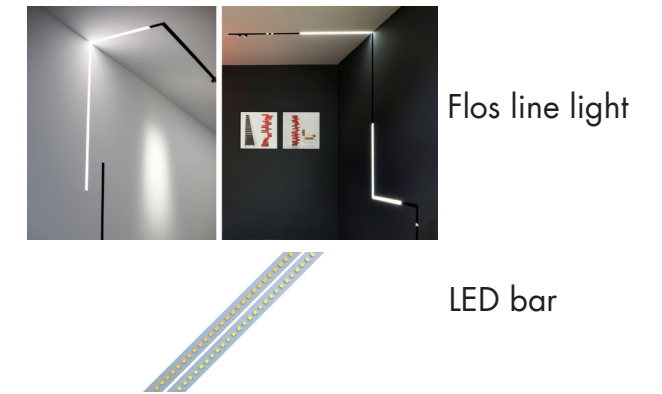
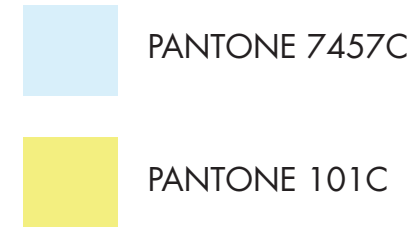
REAL COLOR



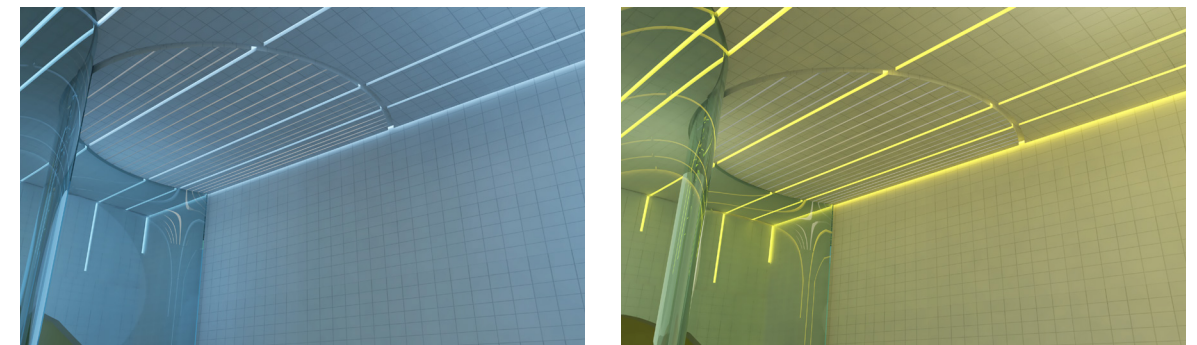
MATERIAL



LIGHT COLOR



LIGHT EFFECT OF MELATONIN



- At 8:00-12:00 am, open blue light for the bathing patient. The blue light simulates the blue sky, which inhibits the production of melatonin in the body, allowing the patient to stay awake during the day after using the bathroom.
- At 14:00-18:00, the patient turns on the yellow light, and the yellow light simulates the sunset, helping melatonin secretion to affect the faster sleep at night.

SENSORY ROOM



The Dutch term Snoezelen (pronounced "snuzelen"), formed by the words "sniff and doze," Snoezelen is a type of therapy originally founded in Holland for individuals with cognitive and Developmental disabilities. In English, we call the sensory room. A private room displays optical illusions with combined lighting effects, aromas, colors, textures and sounds to stimulate a person's olfactory, auditory and gustatory Systems.

Some of the benefits of using this form of therapy are provided:

1. Increased patient and Caregiver Communication

One of the key benefits of this therapy is its ability to reduce an individual's fears and enhance their trust in the people closest to them. Snoezelen can be specially adapted to meet the needs of the individual, delivering stimuli to seven of the senses. The environment facilitates better communication (both verbal and non-verbal) during and after therapy and is thought to deepen the relationship shared between caregivers and the individuals receiving care.

2. Increased Knowledge and Understanding of the Environment

In a controlled multi-sensory environment, patients receive a steady stream of stimuli that automatically increases their awareness (autonomous discovery) and understanding of their surroundings. This shows in magnitude just how sensory-deprived many Alzheimer's patients are and the benefits of clinically engaging their senses during senior care.

3. Improved Behavior and Mood

Sensory therapy has proven effective in calming aggressive behavior and improving mood. It is believed that this non-threatening environment offers gentle stimulation that reduces tension (Snoezelen settings include dimmed lighting, intriguing aromas and soothing sounds), replenishes the spirit and allows recuperation. Snoezelen Has been used as an effective "Sundowners" intervention and for treating other Alzheimer's manifestations.

4. Improved Self-Esteem

The benefits of Snoezelen may differ between each person, but may include improved self-esteem. The rationale is that with an elevated sense of awareness (of both self and the environment) coupled with reduced inhibitions.

SENSORY ROOM



Vision

In the bathroom lighting design of the Alzheimer Care Center, I used linear lighting to simulate the effect of natural water. Because the patient is different from the real sensory room during the bathing process, it creates more uneasiness. In order not to cause fear to the patient, I use a fixed light. Only dynamic changes have been made to the shape.

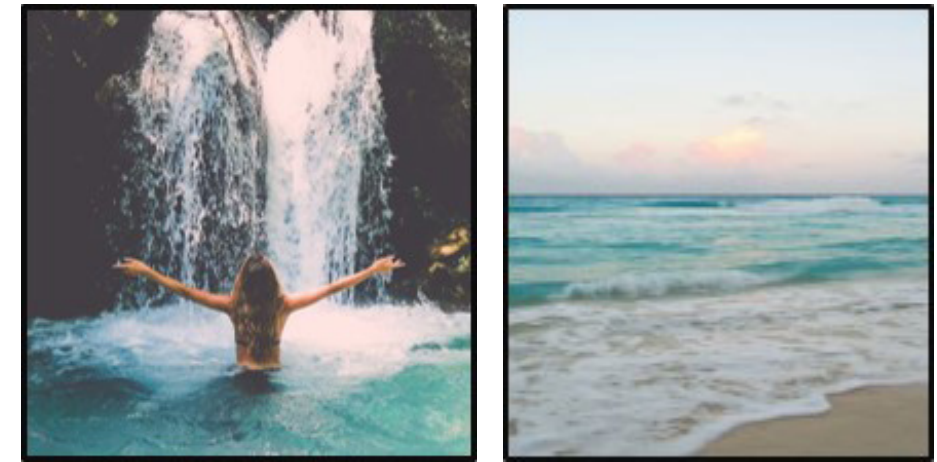
The key to the visual elements of the sensory room is the light. The space is generally semi-dark, creating different lighting effects on white or light-colored walls, and the soft lighting does not create too much shadow.



COLOR

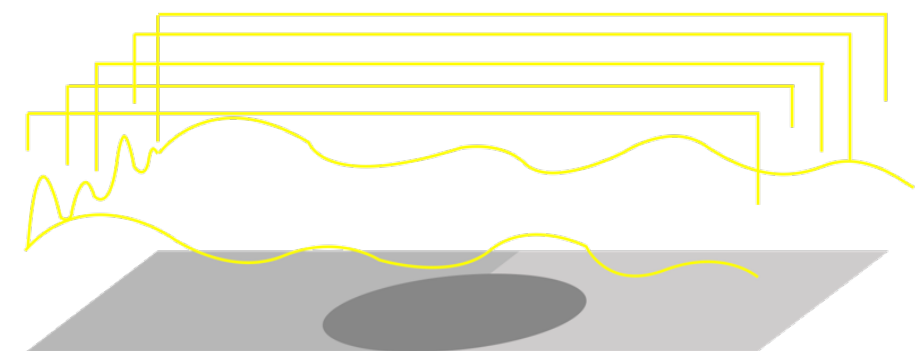


SHAPE



POSITION

The ceiling lights use flos line light to simulate the shape of the waterfall. The upper part of the aroma wall is modeled as a wave by the led bar.



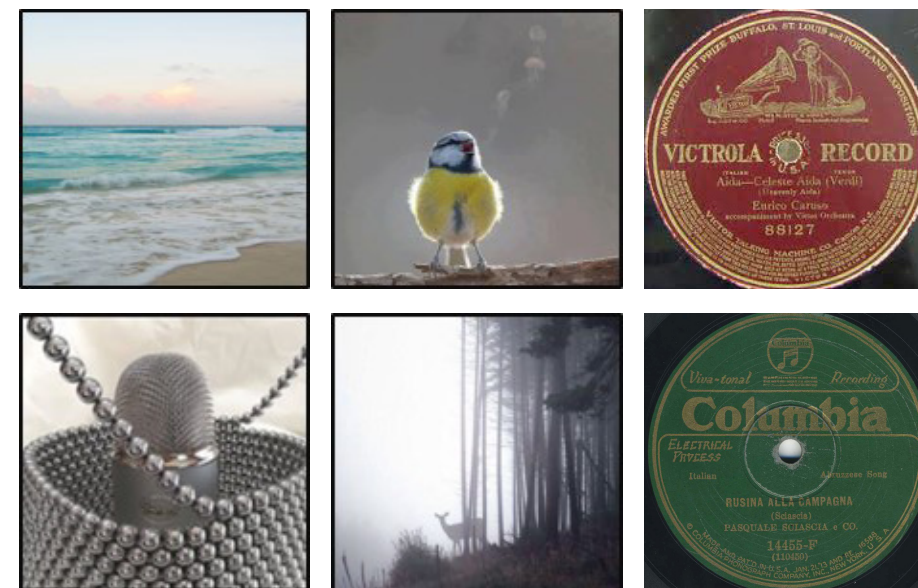
SENSORY ROOM



Sound

Sound can relieve emotions (some natural sounds), affect brain activity (some familiar melody), and help attract the attention of patients so they are no longer nervous. At the same time help the nursing staff to ease the mood.

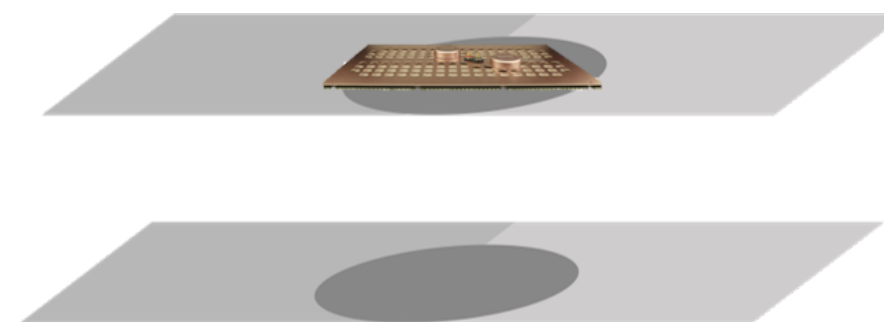
The water in the bathroom during the bathroom and bathing process has an effect on the player. So I hid the player in the gray space ceiling, in the same position as the dryer. The sound can be played through the hollow of the ceiling.



Sound content

- In the morning, to mobilize the patient's initiative, try to play some of the melody that they are familiar with, such as classic songs.
- In the afternoon, to calm the patient's emotions, use the sound of the waves, birds, asmr, forest sounds and other relaxed sounds.

POSITION



SENSORY ROOM



Sound

Smell is a kind of switch that opens up my memory. The smell can help the patient to relieve the mood, increase the appetite, make them feel sleepy, and recall something.

Smell is the mildest sensory experience for the patient and most directly affects the patient's mood. Aromatherapy walls are used by changing the fragrance according to the time of use of each patient. For example, Near the time of nap, in order to avoid the sundowning problem caused by nap, you can use the lily Patient to stay awake.



What is on the wall ?

Day  lily  citrus  sandalwood

Night  jojoba  lavender  ylang ylang

Basil	Relieve headache
bergamot	Acts on the urinary tract and digestive tract.
Rosemary	Good for the nerves and circulatory system.
Black pepper	Muscle pain and bruises
Ginger	Used to relieve arthritis pain.
Chamomile	eczema
lemongrass	Can be used as an insect repellent
clove	Local analgesics or painkillers
eucalyptus	Relieve the airways during a cold or flu.
Geranium	Skin problems.
lavender	Enhance relaxation and sleep.
lemon	Relieve stress and depression.
tea tree	Antiseptic and disinfecting properties.
Thyme	Helps reduce fatigue, stress and stress.
Yarrow	Reduce joint inflammation.

POSITION



SENSORY ROOM

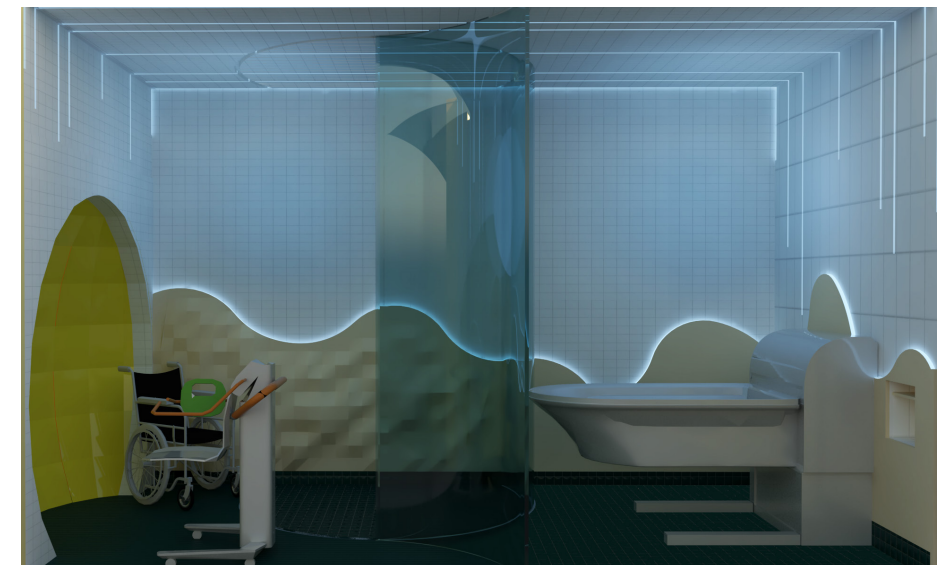
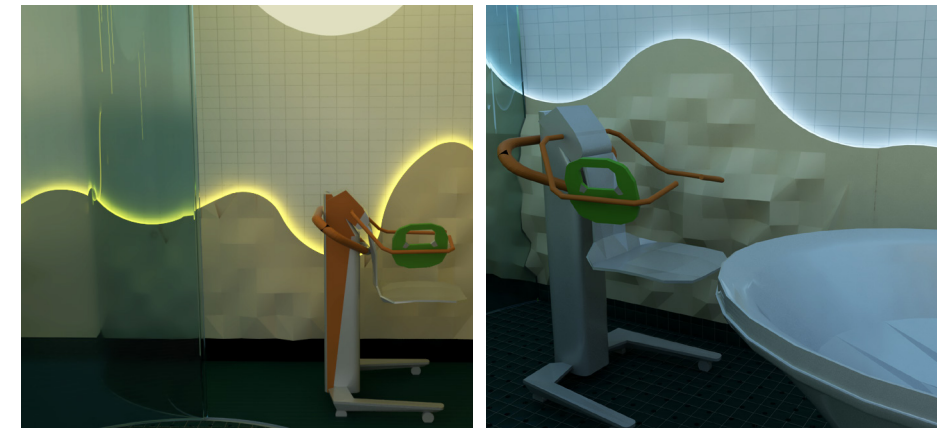


Sound

People with Alzheimer's disease are slow to touch because of their condition. Normal people can reach 300 different planes within half an hour, but Alzheimer's patients can only accept and touch three kinds.

The shape of a part of the aroma wall is made into a touch wall that simulates the undulating waves of the beach. Let the patient take a break after bathing

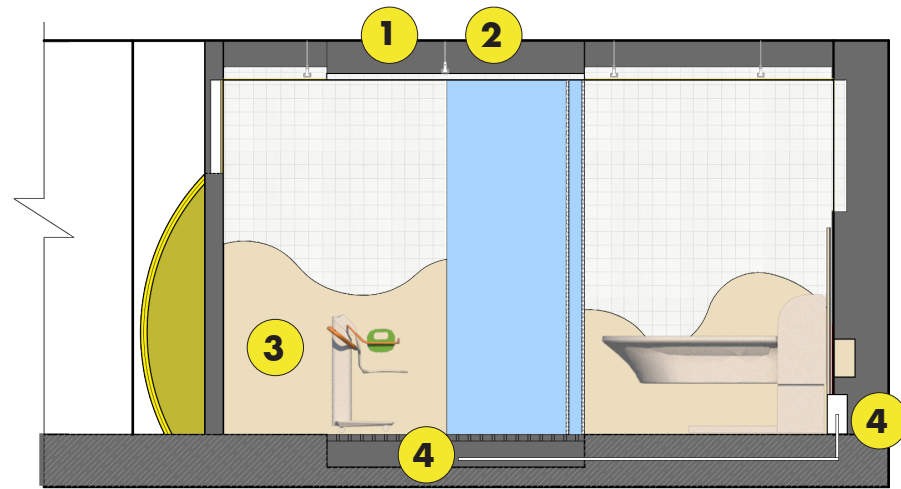
The touch wall is used as part of the aroma wall and is used in gray space and dry space because the patient has no chance to touch the wall in the wet space. The touch wall of the gray space can touch the ripples of the wall to relieve the pressure while the patient feels the water vapor.



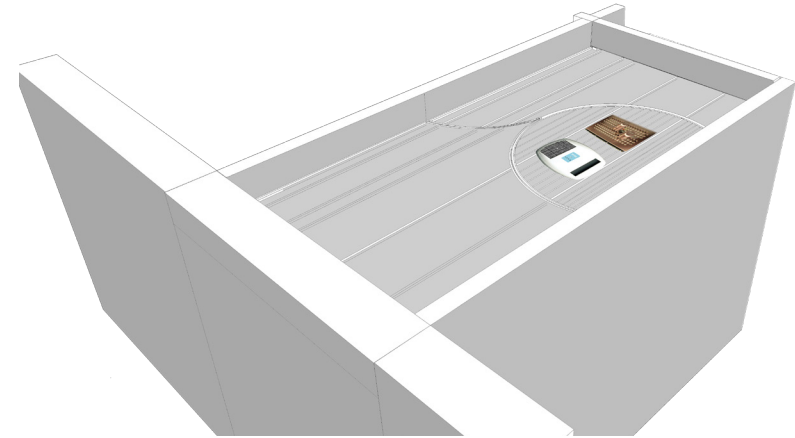
POSITION



INSTALLATION



1 2
POSITION



Triton body dryer

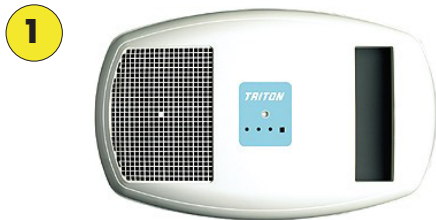
- Effortlessly dry your body without keeping damp towels in your bathroom.
- More gentle on your skin than towels and more hygienic too.
- For those cold winter mornings it also doubles as a fast, efficient bathroom heater.
- Reduces moisture in the air, making bathrooms less damp all-round.

SIZE: 300*50*230

Panen Audio

- Bluetooth control
- Smaller than the average sound volume

SIZE: 150*29*75



Triton body dryer



Wall heating



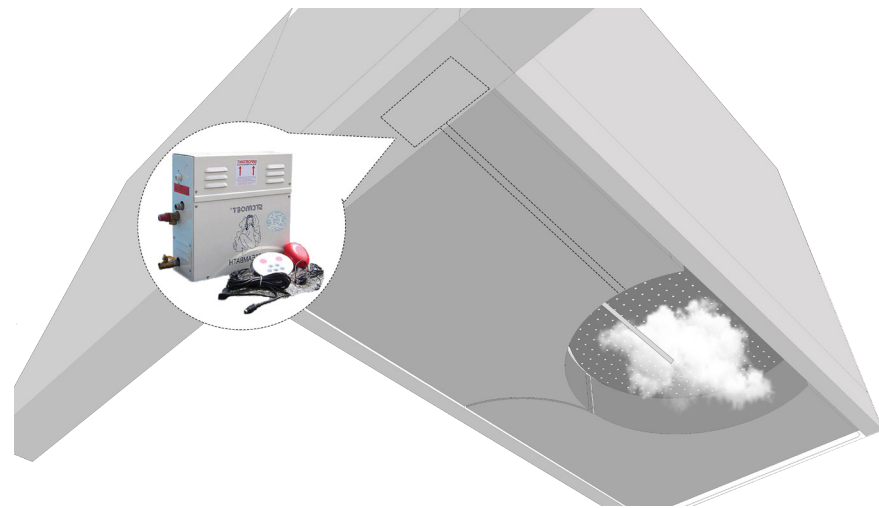
Panen Audio



Home Steam Machine Sauna Bath SPA Steam Shower with Digital Controller

INSTALLATION

3 POSITION



Water tank:stainless steel

Main Material :Electrolytic plate with spray,stainless steel

Function:Wet Steam

Feature:Microcomputer digital display control panel

Control Panel:time and temperature set up

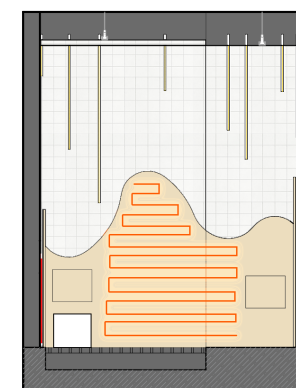
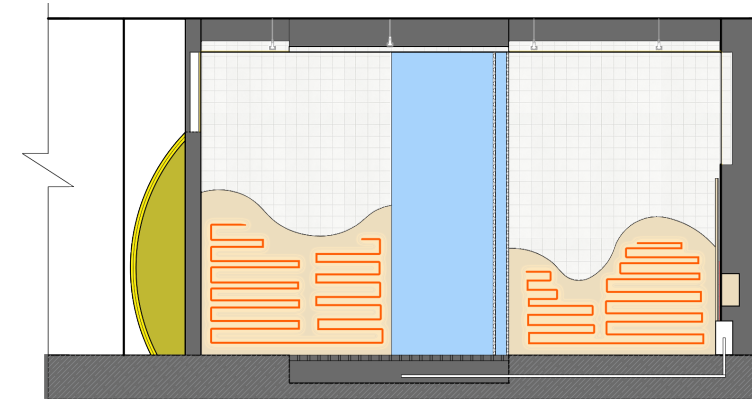
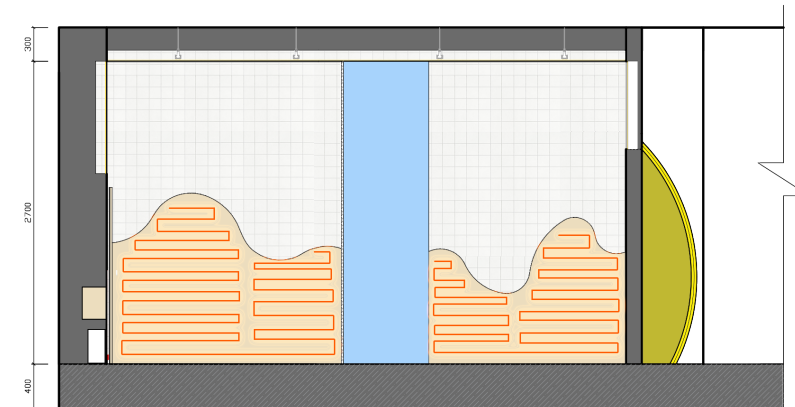
The display temperature is 25-55 degree, normally set 40-45 degree, related with the location of the temperature probe installed and the insulation effect of the room

POWER:4.5KW

USE AREA:4M³

SIZE:320*130*335

4 POSITION



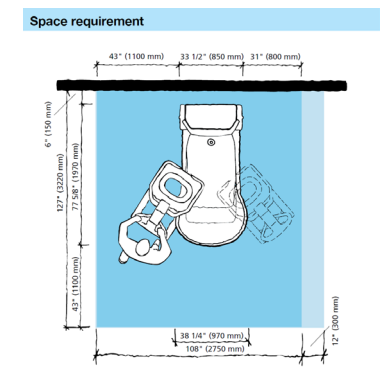
The shape of the heated wall leans against the wavy shape of the aroma wall.

CASE STUDY

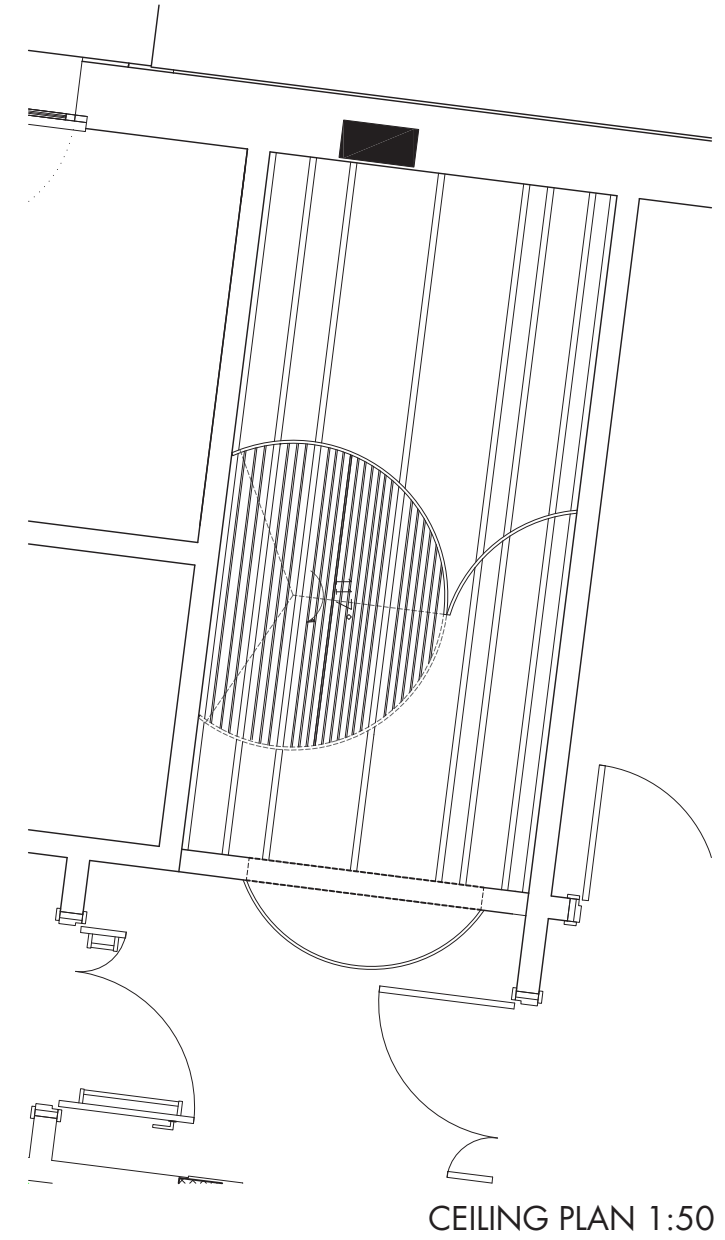
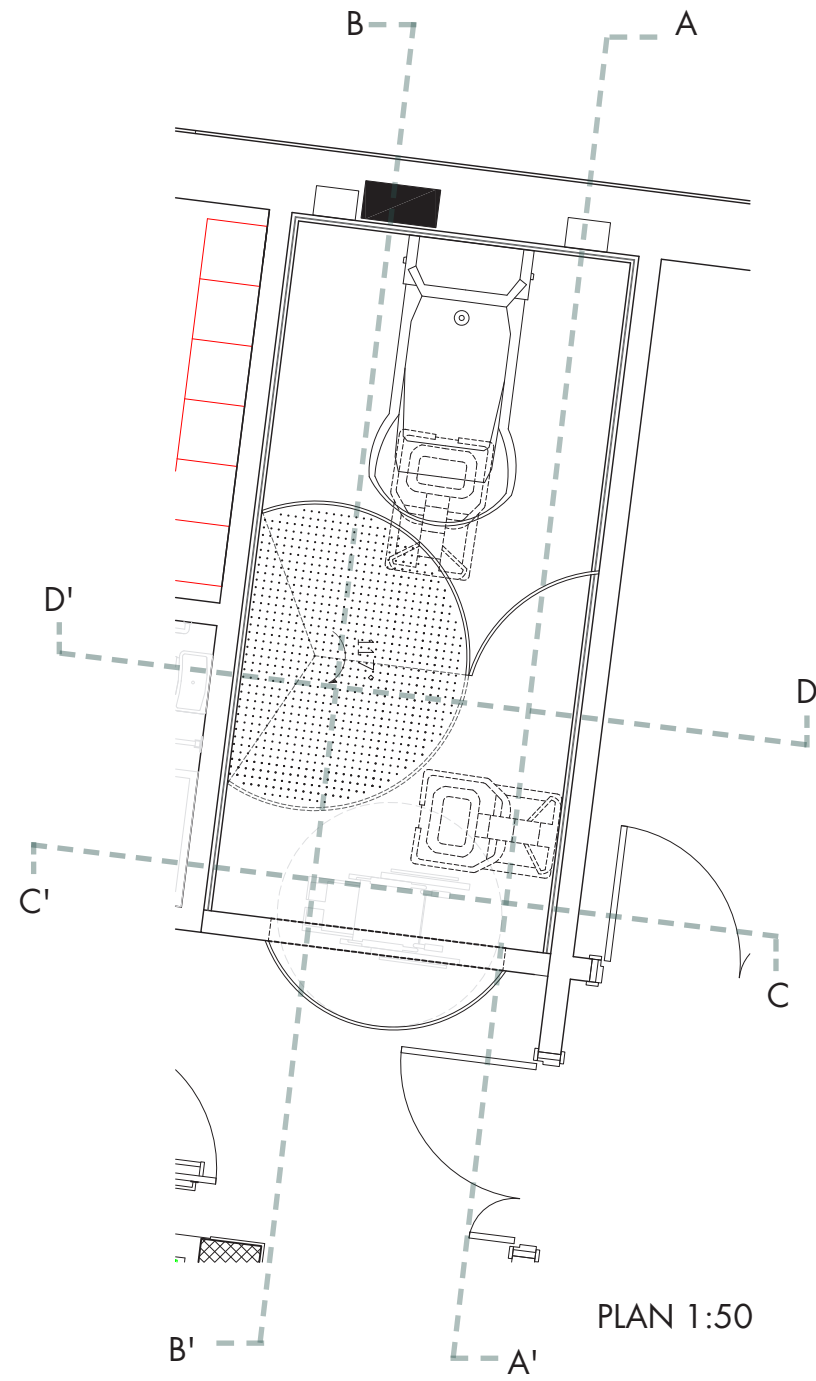
ALENTI

MULTIPURPOSE HYGIENE CHAIR

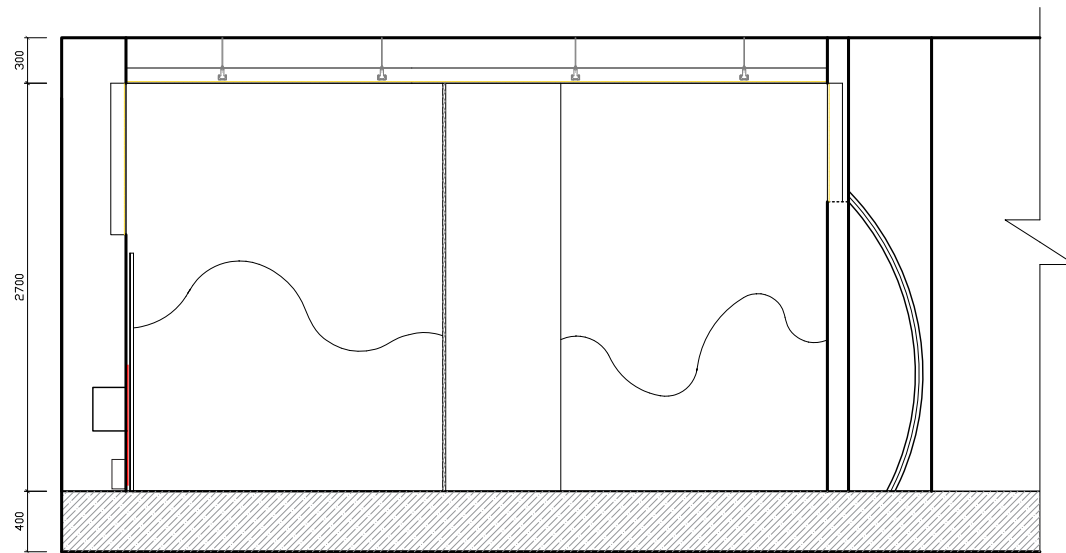
With the Alenti lift hygiene chair, one nurse can safely bring residents who are able to sit up, from bed to ARJO hygiene equipment and back again, without manually lifting, minimizing stress and strain on the caregiver. A moveable back-rest and safety belt allows for transfers from either side of the bed. The Alenti is battery powered for height adjustment via a hand-set. A removable and rechargeable battery makes the lift hygiene chair ready for use at all times. The Alenti operates as an integrated system with all lengths of ARJO height adjustable recumbent bathing systems (Rhapsody and Primo) and with the ARJO Prelude shower cabinet as well as the ARJO century Bath. The Alenti can also be used as a shower chair, allowing the nurse to work in an ergonomically correct posture, to prevent static load injury. An optional electronic scale facts the weighing of residents. No intermediate transfer movements are necessary from the moment the resident is safely seated on the Alenti at collection for bathing or showering, to the moment he or she is transferred back to bed.



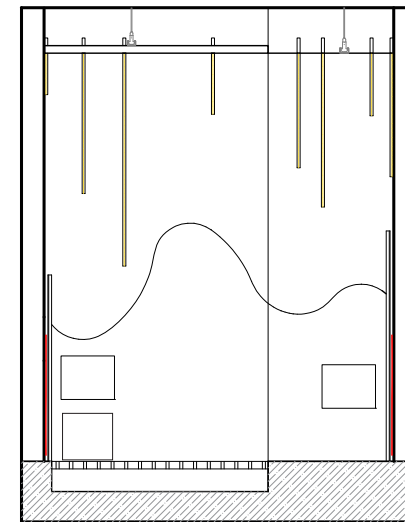
PLAN AND SECTION



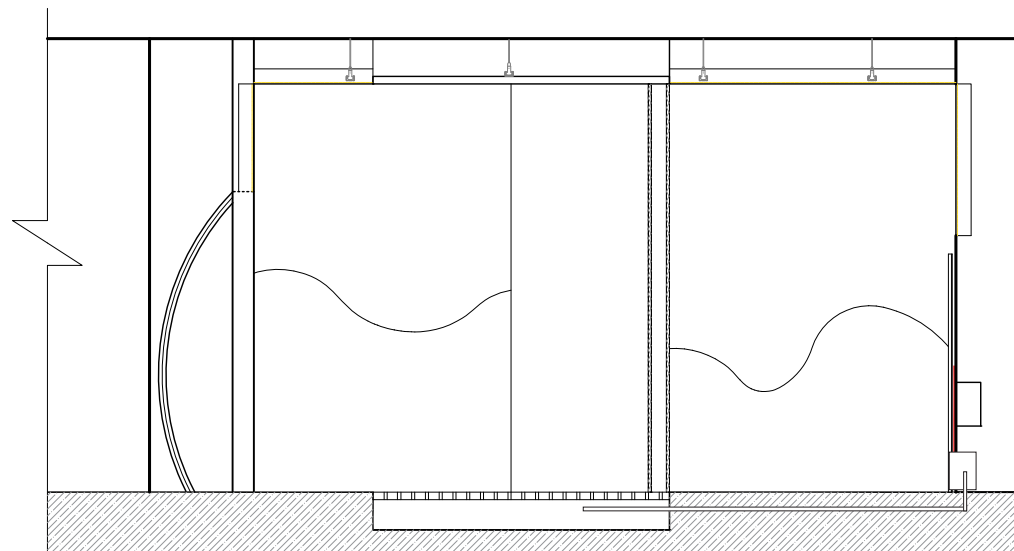
PLAN AND SECTION



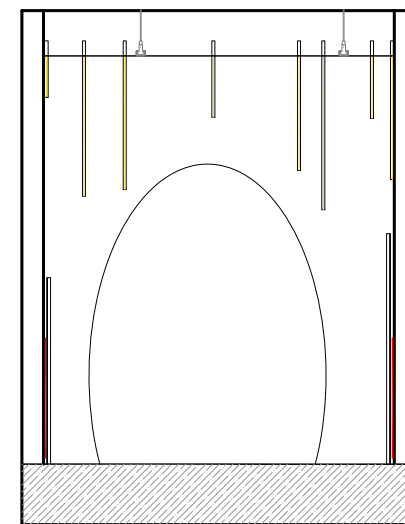
SECTION A-A' 1:50



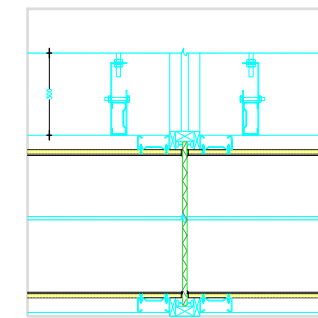
SECTION C-C' 1:50



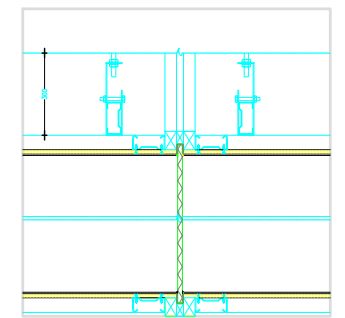
SECTION B-B' 1:50



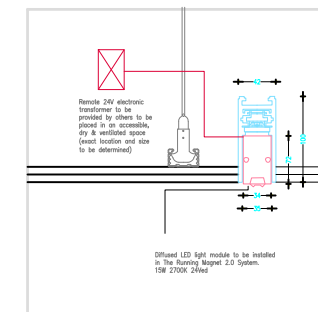
SECTION D-D' 1:50



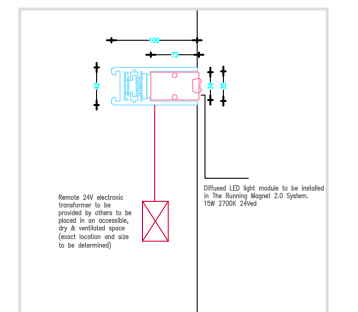
GLASS MOVING DOOR DETAIL SECTION



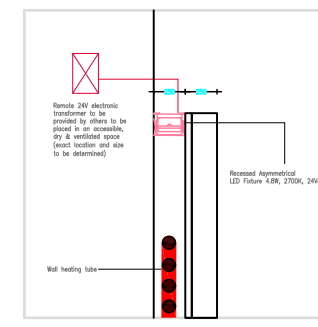
GLASS WALL DETAIL SECTION



CEILING RECESSED LINEAR LED SECTION DETAIL

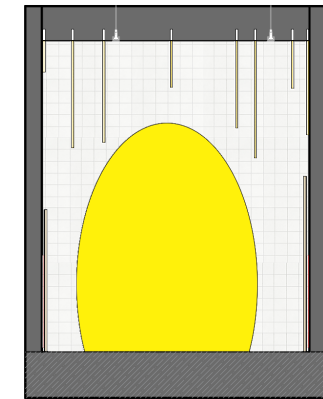
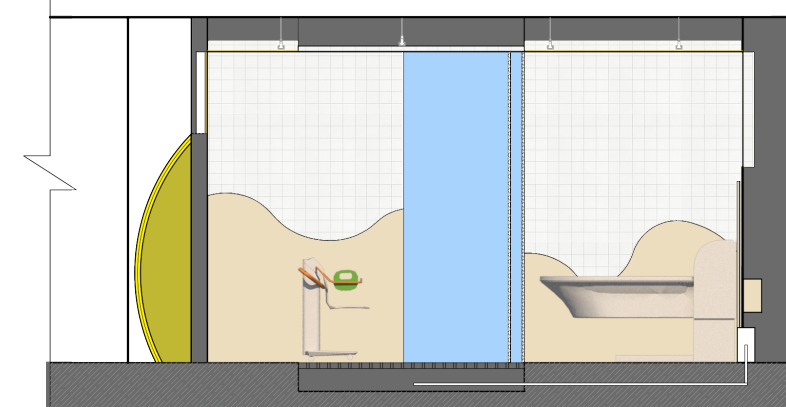
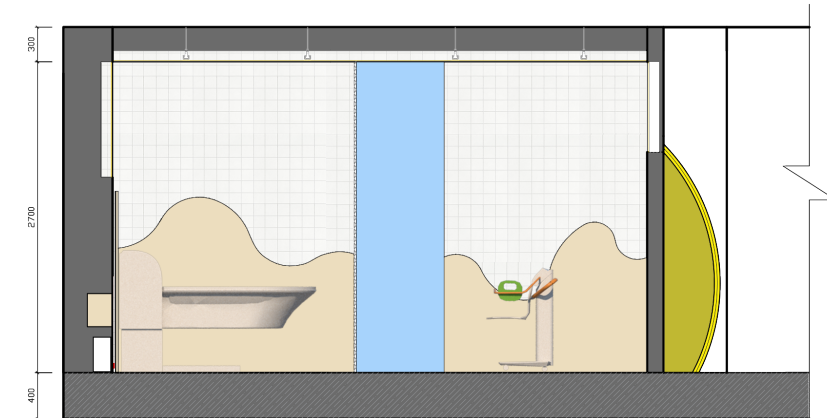
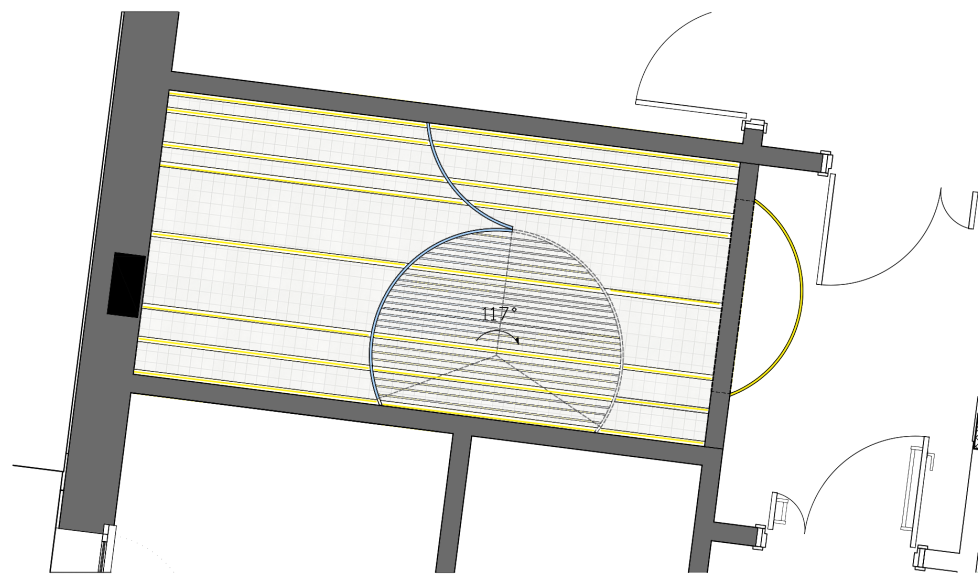
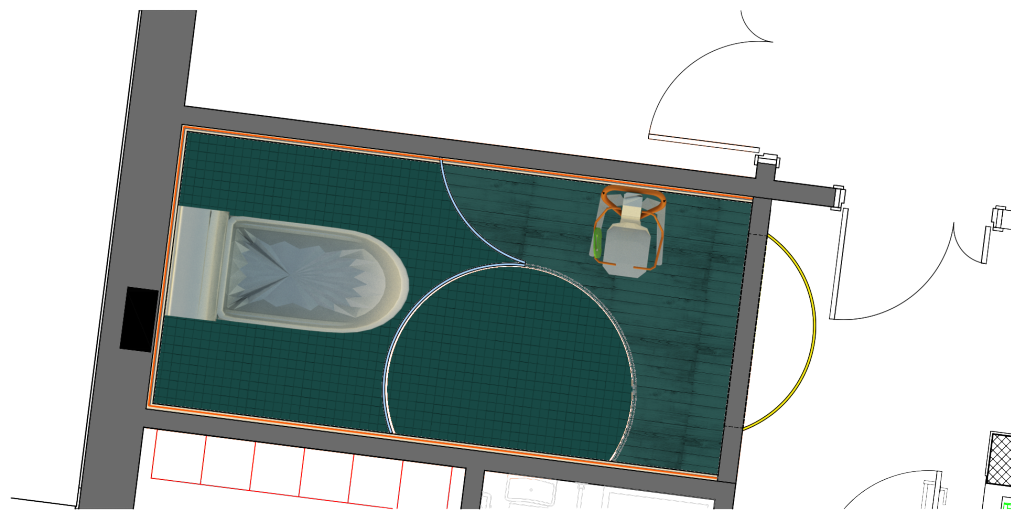


WALL RECESSED LINEAR LED SECTION DETAIL

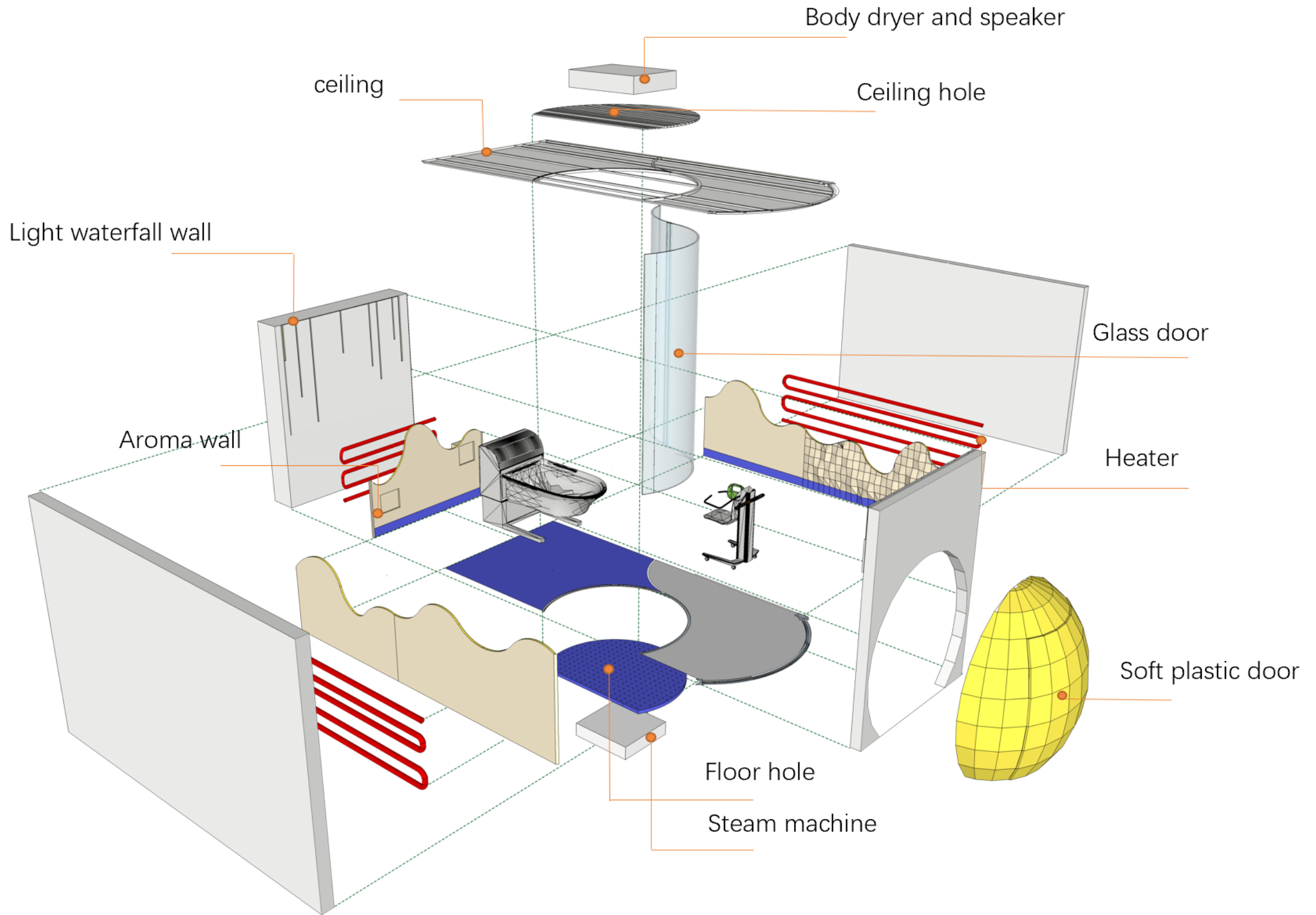


WAVY WALL LED LIGHT DETAIL AND HEATING SYSTEMS

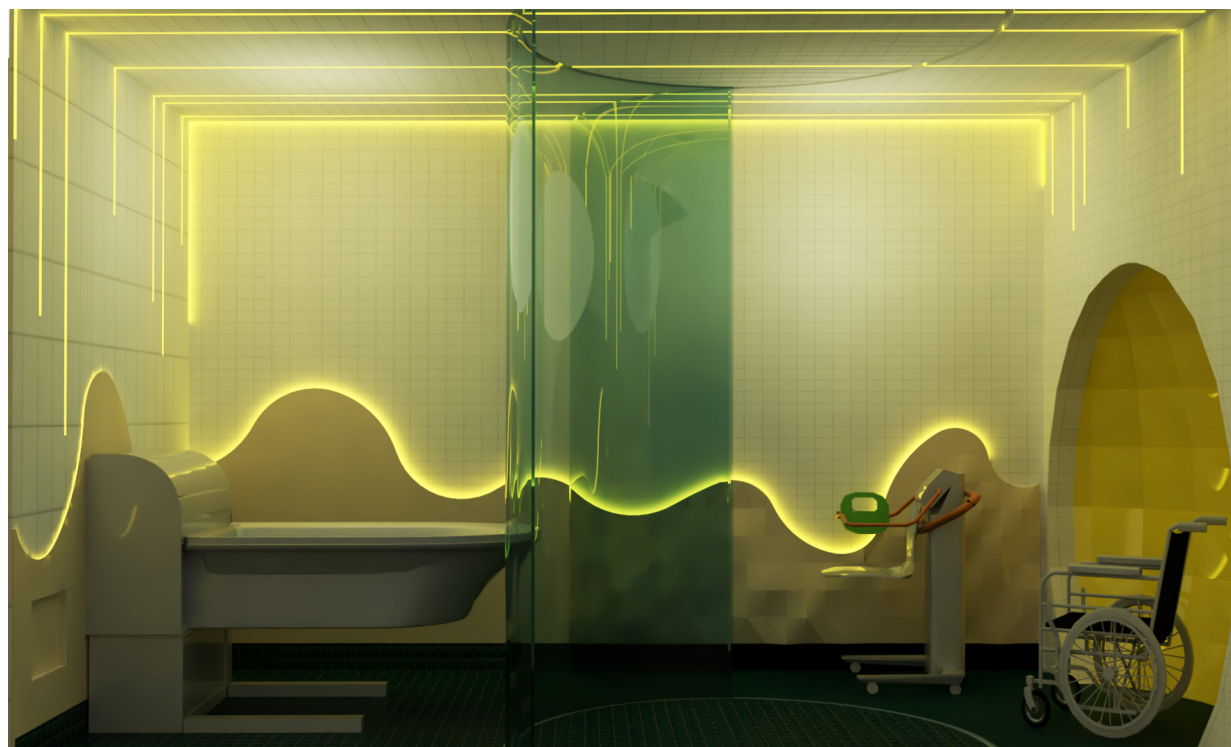
PLAN AND SECTION



EXPLOSION MAP



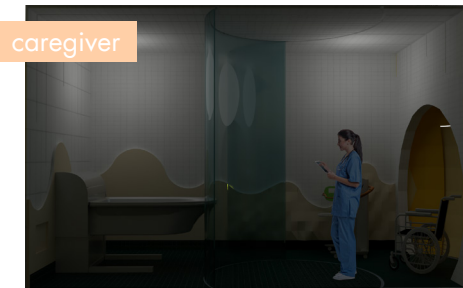
HOW TO USE THE BATHING SPACE



FUNCTION

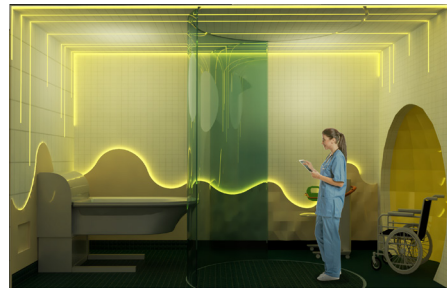
The main functions of the bathing space include temperature regulation, humidity adjustment, odor treatment, music therapy, light therapy, touch therapy and bath function. The caregiver can control all functions through the mobile app during use, and perform function resets before and after use, such as changing the smell and changing the music list. Adjust the temperature and humidity according to different times. We need a complete storyline to understand the specific process of use.

STORY LINE



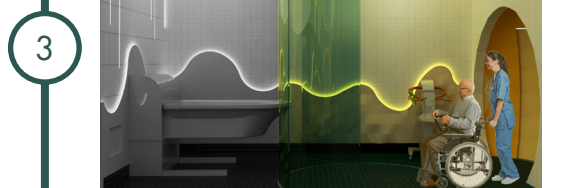
caregiver

1 The caregiver enters the bathroom early and prepares for work.



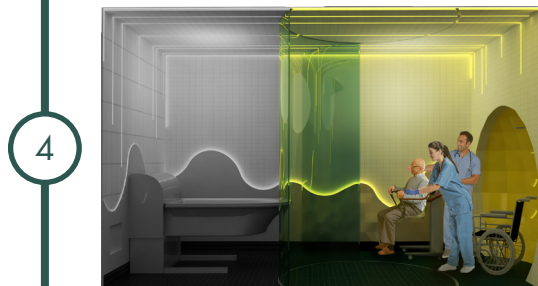
2 The caregiver uses the app to turn on the lights and play music according to different usage times. Turn on the heating system to raise the room temperature. Add water to the bathtub and adjust the temperature of the water.

The caregiver brings the patient into the bathroom and waits for a period of time to adapt the patient to the environment. The elevated temperature with the indoor heater makes the patient want to take off his clothes.



3

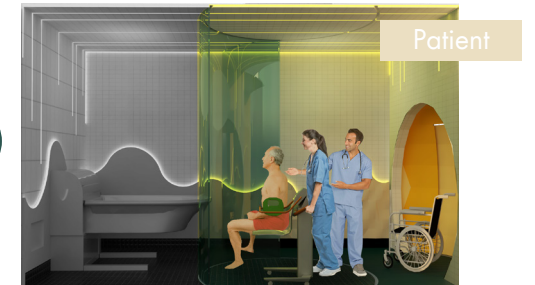
The caregiver helps the patient change from a wheelchair to a professional mobile chair. For patients who are very inconvenient to move, the caregiver can move the moving chair to the room and let the patient go from bed to chair.



4

The patient is pushed into the ash space and the caregiver turns the glass door to allow the ash space to be contained in the wet space.

5



The caregiver uses the app to open the steam machine, allowing the patient to feel the rise in humidity and the skin to be a little moist. At the same time, the presence of water is felt through breathing.

6



caregiver

7

While the patient is experiencing the steam sauna in the ash space, the caregiver can prepare for the bath, such as adding some aromatherapy essential oils to the bathtub.

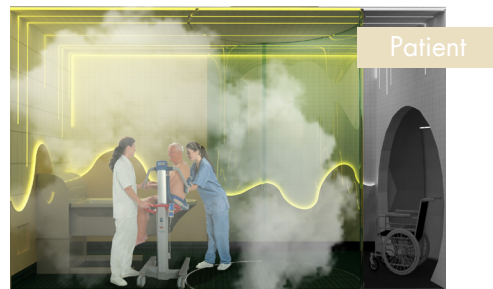
The patient enters the wet space and the caregiver needs to ask the patient about the temperature or fragrance acceptance. And calm the patient's emotions. And turn off the steam machine.

8



Press the button to raise the seat and help the patient enter the bathtub. Slowly lower the seat so that the patient's foot first touches the water and slowly lets the body enter the water.

9



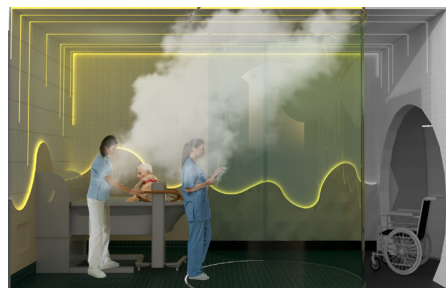
The caregiver helps the patient to bathe, at this time the patient can be lying or sitting.

10



11

During the bathing process, the caregiver can use the cupboard hidden in the wall and take shampoo. This is to prevent the patient from dropping shampoo on the ground, causing himself to slip, or drinking shampoos to create danger.

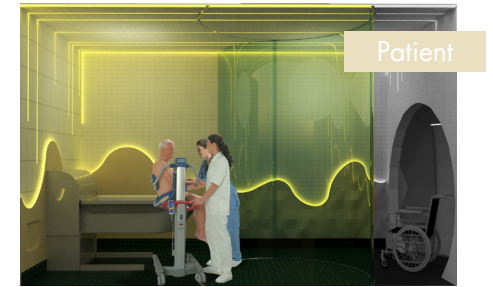


12

At the end of the bath, the caregiver uses the APP to open the dryer, pump away the steam from the room and the water vapor from the bath, and keep the space warm.

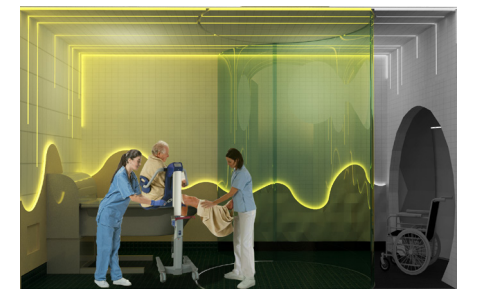
Press the button to raise the seat and help the patient leave the bathtub.

13

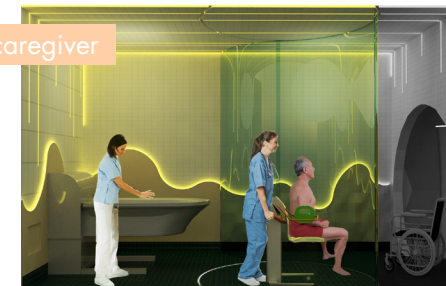


The caregiver helps the patient dry the body, and the dry machine helps reduce humidity and make the patient's hair dry faster.

14



caregiver

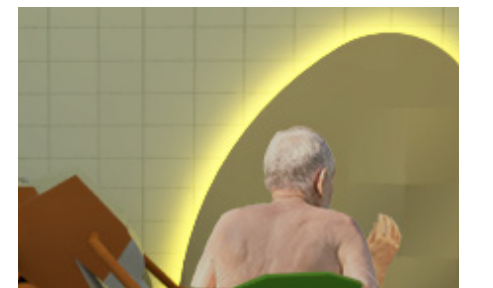


15

The caregiver pushes the patient into the ash space and turns the glass door so that the ash space is contained in the dry space, and another caregiver can work to clean the bathtub.

The patient enters the gray space and calms the patient by touching the wave shape on the aroma wall and rests for a while.

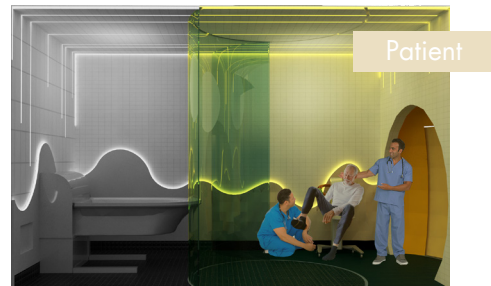
16





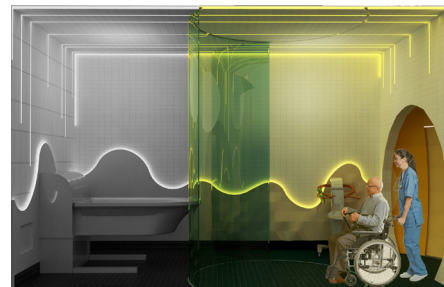
Turn off the dryer and the indoor heater to let the temperature drop. The caregiver helps the patient to wear clothes.

17



Change the wheelchair, push the patient out of the bathroom, and end the bath.

18



19

The caregiver sprays aroma on the aroma wall. Since the fragrance needs time to spread, after each use, prepare for the next use, and also prevent the newly sprayed aromatherapy oil from being too strong, causing discomfort to the patient.

STORY LINE



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