

# LOOKING TO THE FUTURE

SECOND EDITION

Inclusive Design for People Living With Dementia





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# Contents

**06**

**Executive Summary**



**07**

**Person-Centred Care and  
Dementia-Friendly Environments**

**08**

**Management and Culture Change**

**11**

**Principles of Design**

**14**

**CHAPTER 1:  
Common Areas  
(Lobby, Lift Lobbies, Entrances and Exits)**

**20**

**CHAPTER 2:  
Bedrooms**

**26**

**CHAPTER 3:  
Toilets and Showers**

**30**

**CHAPTER 4:  
Therapeutic Activity Spaces**





**34**

**CHAPTER 5:**  
**Sensory and Reminiscence Areas**

**38**

**CHAPTER 6:**  
**Quiet Spaces**

**40**

**CHAPTER 7:**  
**Dining Areas and Dry Pantries**

**42**

**CHAPTER 8:**  
**Therapeutic Gardens and Outdoor Spaces**

**50**

**Annex: Singaporean Environment  
Assessment Tool (SEAT)**

**58**

**Contributors**

**59**

**References**



# Executive Summary

## 2ND EDITION OF “LOOKING TO THE FUTURE”

With our population ageing rapidly, Singapore is faced with an increasing number of people living with dementia (PLWD). They may be living at home, in the community or in long-term care homes.

As we continue our journey to become more dementia-inclusive, we recognise the growing interest and need to build on dementia-friendly design in community care facilities.

This guide serves as an update and expansion of the 2016 “Looking to the Future – Designing and Managing Residential Facilities for People with Dementia” which was developed with references to evidence-based practices and in consultancy with the Dementia Nursing Home Design and Resource Panel comprising local clinicians, operators, policy makers and nursing home staff. The objective of this guide continues to focus on enhancing the environment with retro-fits and minor adaptations such as choice of furniture to optimise the dementia-friendliness of the environment to enable and support the person living with dementia.

Six principles in designing dementia-friendly facilities and spaces were identified:



### Safety

Design ensures a safe environment for seniors to move around



### Empowerment and autonomy

Design supports seniors in making choices



### Homely environment

Design should include familiar items that seniors can relate to and should enable seniors to feel comfortable in their surroundings



### Personal space and privacy

Design allows for seniors to be cared for in a respectful and dignified manner and caters to personal moments when needed



### Meaningful participation

Design should encourage seniors to participate in meaningful activities independently or as a group



### Appropriate environmental stimulation

Design should provide the appropriate level of sensory stimulation for the seniors

In our learning journey, we seek to understand how dementia-friendly design influences and supports seniors in their daily living. Ideally, support systems and processes are planned and implemented by the upper management in community care services. Concurrently, there are researchers, urban planners and architects working to evaluate and monitor seniors’ well-being, satisfaction and responses to the environment cues. This will contribute to the continuous learning and adaptation of dementia-friendly design principles that works best for the care facility in the community.

This guidebook is organised according to location, for the user to conveniently refer to the relevant spaces that will be renovated or enhanced to be more dementia-friendly. The 6 dementia-friendly design principles are incorporated in the illustration of the spaces and features current practices and modifications from existing Nursing Homes and Eldercare Centres.

# Person-Centred Care and Dementia-Friendly Environments

Historical and research evidence posit that custodial approaches to caregiving and design of the environment fall short of what is optimal for dementia care. With the growth of dementia-friendly communities, increased research and media attention on dementia in the last decade, there is reduced stigma and a growing acceptance of people living with dementia (PLWD) in Singapore.

Person-centred care (PCC), a value base for quality of life and care for PLWD, has seen a growing adoption locally and globally. PCC is a salutogenic care ethos first conceived by Tom Kitwood of the Bradford Dementia Group in the United Kingdom; it prioritises the need to value the person as a unique individual, to uphold personhood, facilitate autonomy and accord dignity.

Person-centred care provides the foundation for enabling environments in dementia care. The physical or built environment has for many years been recognised to impact health, physical and emotional well-being. Research on therapeutic healing environments and international movements have contributed to the burgeoning of dementia-friendly environments world-wide which move away from a focus on deficits to harnessing the innate and residual potential in PLWD to continue to lead purposeful and productive lives.

Dementia-friendly environments enable PLWD to preserve their selfhood and identity by maintaining normalcy through engagement in familiar routines and activities that hold personal meaning. It is an environment that is ever inclusive, familiar and accessible. Empirical evidence suggests that PCC coupled with a supportive environment leads to an increase in sensory and social engagement, which in turn ameliorate functional and cognitive decline.

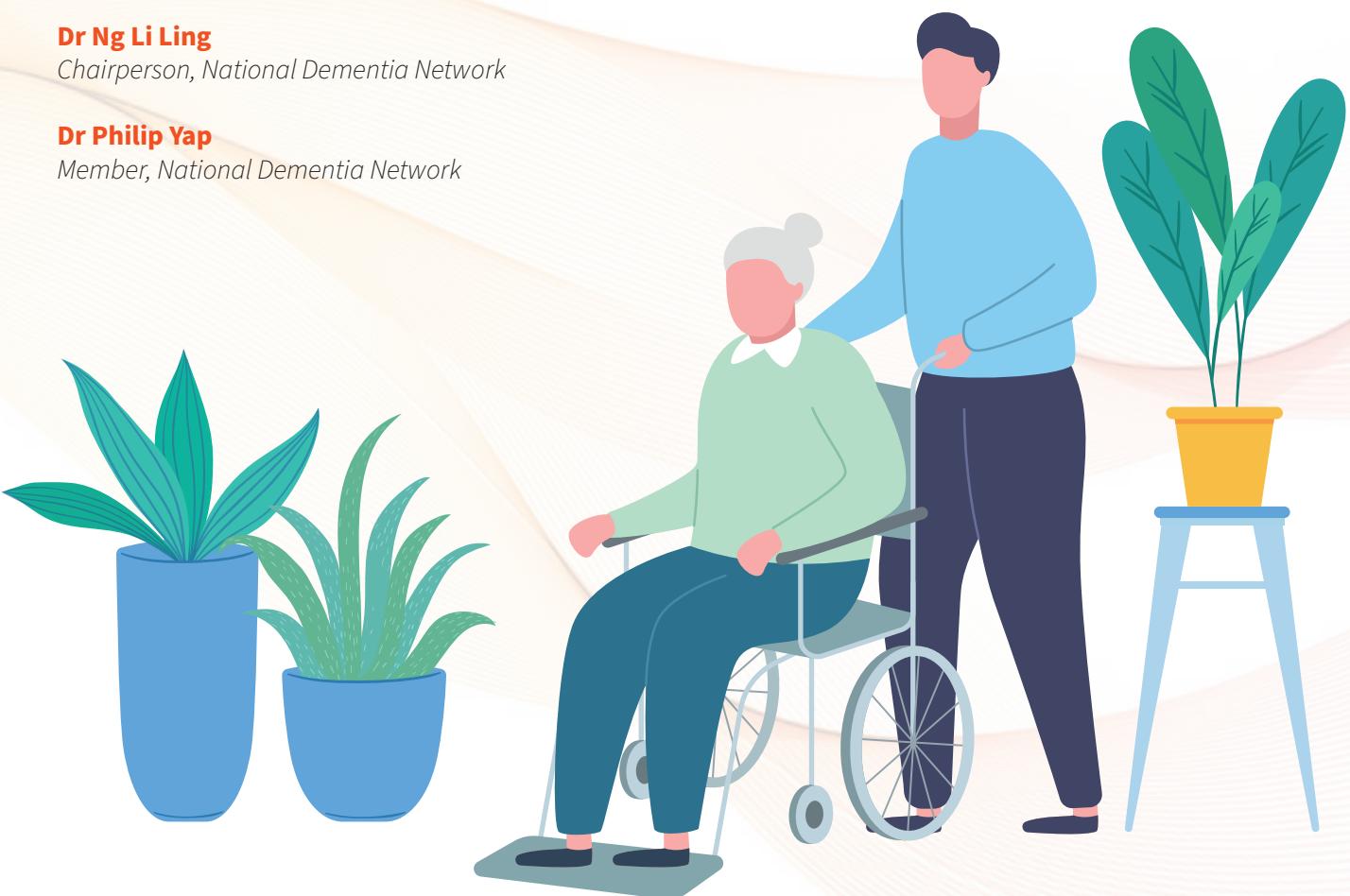
This guide aims to provide the fundamentals on dementia-friendly design and empower care staff in the delivery of PCC in an enabling environment.

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# Management and Culture Change

## WORKING TOWARDS QUALITY IMPROVEMENT AND ORGANISATIONAL EXCELLENCE IN DEMENTIA CARE

The provision of good dementia design in itself is not sufficient to ensure good care in eldercare facilities. Dementia-friendly design is only one of the components in providing an empowering environment for the PLWD. Other components that are pertinent to create an enabling environment include a change in the mindset of the care staff and support from their management. PCC is a philosophy that needs to permeate all levels of staff, management and operations. An organisation that has a clear vision and set of strategies, effective leadership and comprehensive operational planning and implementation will succeed in providing good dementia care.



## PHILOSOPHY OF CARE AND CULTURE CHANGE

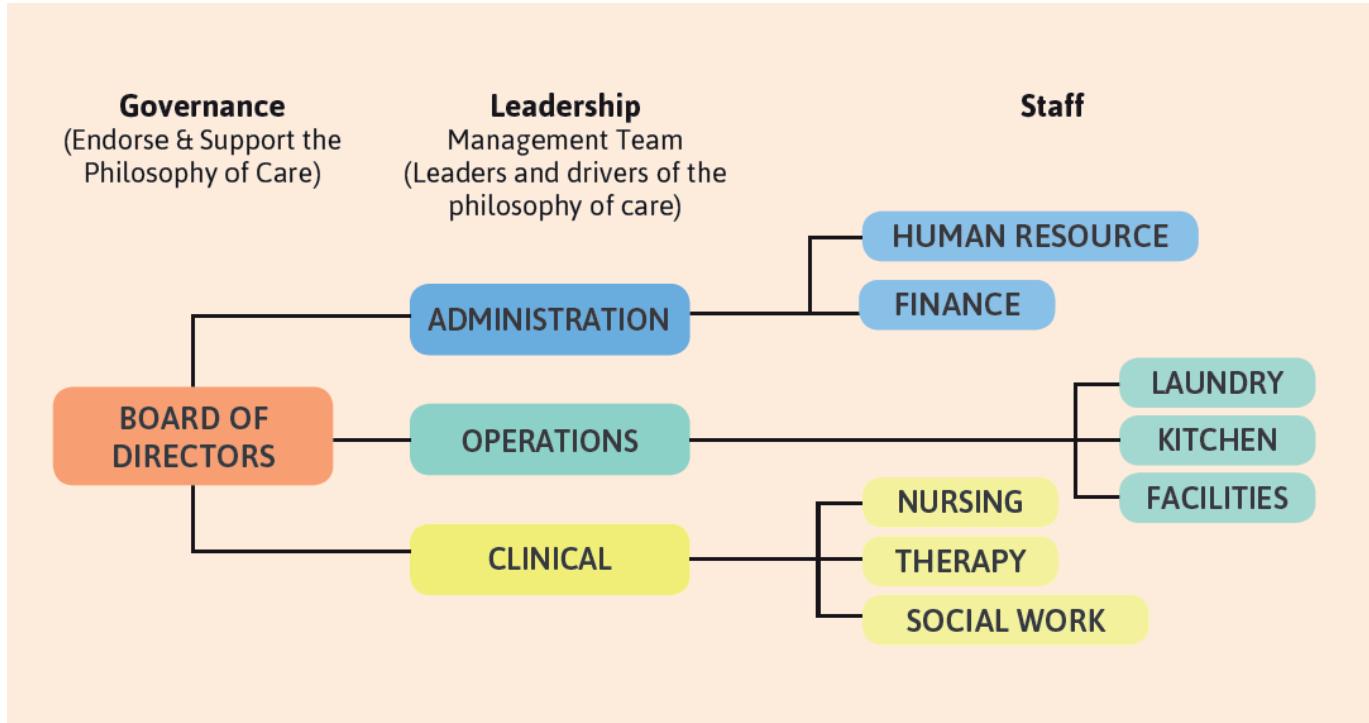
The philosophy of care is the underlying belief that drives all aspects of the organisation including policies, care models, operations, capability building and commitment of care to the client.

When an organisation makes the decision to embrace PCC and adopt it as their philosophy of care, this often involves a culture change from an institutional model of care to a more person-centred practice that values the preferences and enables choices to be made by the PLWD and their caregivers.

Culture change is a journey and the organisation needs to create and support a learning culture, where best practices and approaches are implemented and staff have ongoing education and training to practise PCC in their daily care of PLWD.



## ORGANISATIONAL STRUCTURE AND LEADERSHIP



The Board of Directors is responsible for the governance and oversight of the organisation, sets the vision and overall direction for the organisation, endorses the philosophy of care, and supports the management team.

As leaders of the organisation, the management team operationalises and drives the philosophy of care within the various departments and should have the autonomy and authority to effect changes in the culture and approach to care based on the philosophy.

Leaders of the eldercare facility have to be committed to the PCC philosophy and be willing and open to change. PCC should be embedded in all activities and interventions within the eldercare homes and centres:

- Design of a dementia-friendly eldercare facility
- Provision of services for the PLWD and their caregivers
- Capability building and training system for staff
- Operations and management of the facility

Both clinical and administrative leaders play a role in operationalising the processes in the eldercare facilities according to the PCC principles. They need to identify barriers to the implementation and delivery of PCC and understand the roles and experiences of front-line staff.

For example, believing in PCC means that we value the PLWD's individual interests. Therefore, there should be a variety of activities that allow the PLWD choice and enjoyment as well as flexibility in the routine tasks of bathing, eating, etc. Constant monitoring and evaluation of the care process is important to ensure that PCC truly influences everything done in the eldercare facility. Staff skills, training and knowledge are important, but so are their attitudes, such as adaptability, flexibility, positivity and commitment. Management attention should be placed on staff capabilities and needs, as well as putting in place systems to identify potential abuse of vulnerable PLWD.



## **VISION, STRATEGY AND OPERATIONAL PLANNING**

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The vision should provide a clear and concise statement that guides the organisation. The organisation's strategy incorporates the goals, decisions, plans and procedures executed by the organisation to achieve quality care for PLWD. Operational planning is about translating the strategies into concrete actions. It includes establishing clear organisational structures, workflows and systems and planning in areas such as human resource management, programming, budgeting, risk management and evaluation. Operations should be evaluated on a regular basis to ensure that the organisation achieves its goals in delivering PCC.

## **EVALUATION OF OUTCOMES**

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The process of evaluation includes the engagement of stakeholders, use of qualitative and quantitative data to assess the quality of care, identify service gaps and adopt best practices.

Some examples of the questions asked should include:

- How do we measure success?
- How can we continue to improve the quality of life for PLWD while managing costs and efficiency?
- How does evidence-based best practice influence care?

When evaluating outcomes to improve the quality of life of PLWD, the organisation should continually aim to:

- Improve management strategies (staff retention, recruitment and improvement of morale)
- Identify areas of capability building and innovation in the organisation
- Build positive relationships between the organisation and the community

In summary, delivering high quality care entails a spectrum of linked work processes and work process designs that are based on clear care targets aligned with the overall vision and philosophy of care. The journey of implementing a truly person-centred dementia-friendly environment requires the commitment of the entire organisation to drive and implement change.

# Principles of Design

It is recommended that dementia design should encompass the 6 dementia-friendly design principles, which have been identified by the Dementia Nursing Home Design and Resource Panel in 2015. We recognise that renovation may not always be possible and is not the only option. By understanding the rationale behind the design principles and incorporating them as minor modifications, the environment can be enhanced to be more dementia-friendly.

## 1. SAFETY

Persons living with dementia (PLWD) have cognitive deficits which may impair recognition of risks and affect judgment. To create a safe environment for seniors and PLWD to move around, the following are some suggestions for reference:

<b>Use colour and contrast to aid visibility</b>	<p>Reduced depth perception may pose challenges in moving around safety. We should use contrasting colours and ensure sufficient tone contrast. This encourages visibility and helps in navigating the environment safety and encourage the use of objects.</p> <ul style="list-style-type: none"><li>• Flooring and handrails are differentiated from walls and furniture with a contrasting colour and tone.</li><li>• To enable the PLWD to use the toilet with ease, the colour of the toilet seat cover and lid should have sufficient contrast from that of the toilet bowl. The colour of the toilet bowl should be differentiated from that of the floor.</li><li>• Wash basin should contrast against the wall and flooring, for PLWD to accurately judge its location.</li></ul>
<b>Practise fall-prevention measures</b>	<ul style="list-style-type: none"><li>• Minimise wet floors by installing non-slip, matte and quick-drying flooring. Take precautions for areas that are prone to get wet, e.g. toilets, hand-washing areas, floors beside windows that are prone to rain splashes.</li><li>• Design of the facility should facilitate air circulation but reduce rain splashing into the facility and wetting the floors.</li><li>• Install grab bars at PLWD-accessible and slippery areas. Grab bars should be strong enough to withstand and support the bodyweight of an individual. The materials of the grab bars must allow good grip.</li><li>• Measures to prevent fall from height include installation of railings or grilles with at least 1.5m from floor level at higher floors. Design of railing and window grilles should also avoid features that aids scaling e.g. horizontal bars and ledges.</li></ul>
<b>Restrict unsupervised access to high-risk areas</b>	<ul style="list-style-type: none"><li>• Obvious emphasis on restrictions may have unintended and adverse effects on the PLWD such as agitation. Camouflage exit doors or doors that may lead to hazardous areas, through the use of colours or plants.</li><li>• Unsupervised access to elevators or outdoors should be limited. This can be achieved by installing keycard access and auto-lock doors to limit unsupervised access to kitchens, roof tops, etc.</li><li>• Use motion sensors that alert staff when doors leading to the outside are opened, so that PLWD leaving the premises may be attended to. CCTVs may be installed in these high-risk areas. Technology that are unobtrusive and alerts staff when they are on duty would be ideal in a person-centred care environment.</li></ul>
<b>Effective and appropriate lighting</b>	<ul style="list-style-type: none"><li>• Effective lighting is a crucial element in the design of the living spaces of the PLWD. Living areas should have a combination of increased light levels, good colour definition, good contrast in colours minimising glare, and avoid sudden changes in light levels.</li><li>• Lighting, whether natural or artificial, must be adequate to provide colour temperature equivalent to warm white light of about 3000K in both day and night time.</li><li>• Harsh lighting should be avoided while spot lighting should be judiciously used to highlight signage or areas that the PLWD should take note of.</li></ul>

## 2. EMPOWERMENT AND AUTONOMY

When designing facilities for PLWD, emphasis should be placed on maximising their well-being and confidence, to preserve their sense of autonomy and independence. Design features that aid self-direction and maintain independent choices will enable PLWD to live as autonomously as possible. This must be coupled with meaningful activity and positive interaction with care staff.

**Use appropriate orientation cues and signage**  
(e.g. direction to toilets, dining hall, etc)

Good use of orientation cues enables PLWD to recognise where they are. Signage should be simple, clear and of a suitable size. There should be contrast between text, its background and also the surrounding environment. The use of signage enables PLWD to move around independently and participate in activities to maintain their cognitive and physical ability, slowing the process of deterioration. Besides signages, unique themes and colours can be used to differentiate between floors and rooms for easy way-finding.

**Easily recognizable fixtures and fittings**

Fixtures and fittings such as switches, knobs and taps which are culturally relevant are important and contrast against its background to help the PLWD identify and operate them with ease.

## 3. HOMELY ENVIRONMENT

The term “homely” connotes safety, security, a sense of belonging, enjoyment, relationships and emotions. A homely facility should be familiar to the PLWD and reflect the cultural characteristics of a typical Singaporean setting.

**Use furniture that is familiar to PLWD**

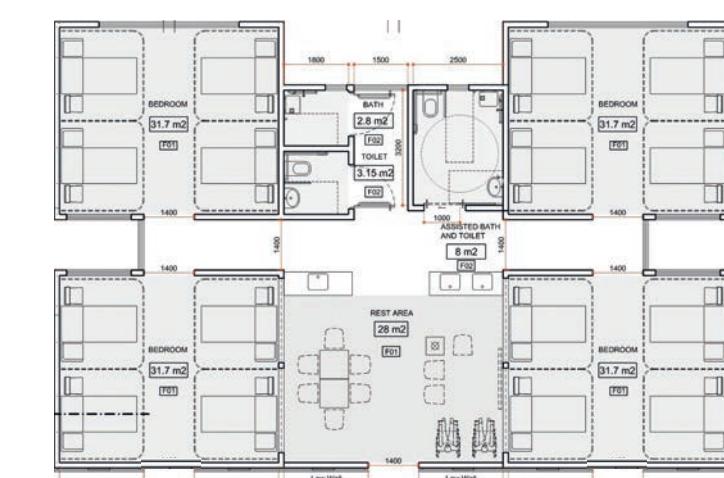
In a more familiar and comfortable environment, PLWD will be more calm and relaxed. This is likely to optimise the PLWD's and staff's well-being and enhance their performance in activities.

Recommend for the facility to include furniture that is familiar to PLWD and provide areas for reminiscence.

**Spaces for interaction with family and friends**

Spaces should be provided for PLWD to interact with family and friends.

For instance, create home-like environment by adopting the cluster living concept. The cluster living concept enhances care as it encourages mobility and independent living. It involves PLWD forming smaller, personal groups in socially manageable living spaces. Each cluster consists of bedrooms, toilets/ showers and common activity spaces to promote social interaction.



Source: Facility Guidelines for Nursing Home by MOH Holdings Pte Ltd (MOHH)

## 4. PERSONAL SPACE AND PRIVACY

Spaces are required in a care facility for both individual and group activities.

Operational functions such as delivery of goods or rubbish collection should be designed such that they do not come into the view of clients, so as to reduce interference and disturbances to the PLWD.

<b>Personal Spaces</b>	Personal areas enable PLWD to enjoy quiet moments by themselves and are necessary to support PLWD in times of stress. They may prefer to spend some time in solitude in these spaces, as a way of managing stressful situations or episodes of behaviours of concern.
<b>Private Spaces</b>	Provide opportunities for PLWD to personalise their space e.g. bed partition with board or shelves / cabinets to decorate and give their bed space a personal touch.
<b>Multi-functional Spaces</b>	Private spaces should be provided to preserve dignity for personal life events such as last rites.

## 5. MEANINGFUL PARTICIPATION

PLWD living in nursing homes or attending senior care centres should have opportunities for meaningful participation in activities. This will keep both their minds and bodies engaged and active, and help maintain their cognitive functions.

Daily activities should be culturally and age appropriate, as well as purposeful and meaningful to the individual. Such activities should be tailored to the PLWD's preferences and interests during that period of time.

In planning for meaningful participation in activities, these are some recommendations:

<b>Periods of rest and non-activity</b>	Due to their reduced physical capabilities, it is important to factor in periods of rest and non-activity for PLWD to recuperate physically and mentally.
<b>A range of activities</b>	A range of activities should be provided for variety and choice to cater to PLWD with different profiles.
<b>Option for individual or group activities</b>	An engaging physical environment has resources readily available within the surrounding environment. This enables the PLWD to independently reach out for the items without depending on the staff to set up or provide, e.g. interactive walls, leisure/hobby items, reading materials such as newspapers and personal journals.

## 6. APPROPRIATE ENVIRONMENTAL STIMULATION

Negative and confusing stimuli may aggravate confusion and disorientation in PLWD. To assist PLWD to be able to reorganise themselves in an environment with external stimuli and interact positively with their surroundings, there should be a balance in the amount of stimuli that a PLWD is exposed to. Negative stimuli should be reduced and positive stimuli should be encouraged. A calm and serene environment can alleviate distress and minimise behavioural issues such as anxiety, agitation and aggression.

Avoid exposure to:

- Loud noises and continuous sound
- Drastic swings in temperatures
- Inadequate lighting
- Bright and confusing prints

## Chapter 1

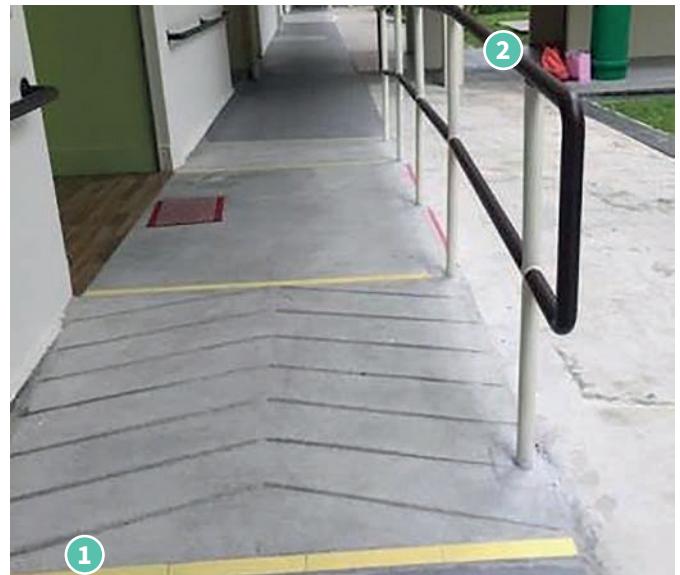
# Common Areas (Lobby, Lift Lobbies, Entrances and Exits)

The lobby and entrance areas form the first visual impression for users, which includes PLWD, visitors or staff. It should be welcoming and provides a safe space with an easily identifiable reception counter and clear signage for navigation and way-finding. It also provides cues for PLWD to identify where they are and helps to orientate themselves.

## MAIN ENTRANCE (OUTSIDE)

**1** Ensure floor is level, highlight where there are level changes.

**2** Install handrails for ramps where required. Ensure that the material used for outdoor handrails is weather-proof and not temperature-responsive i.e. not too hot to touch in the afternoon and too cold at night to hold.

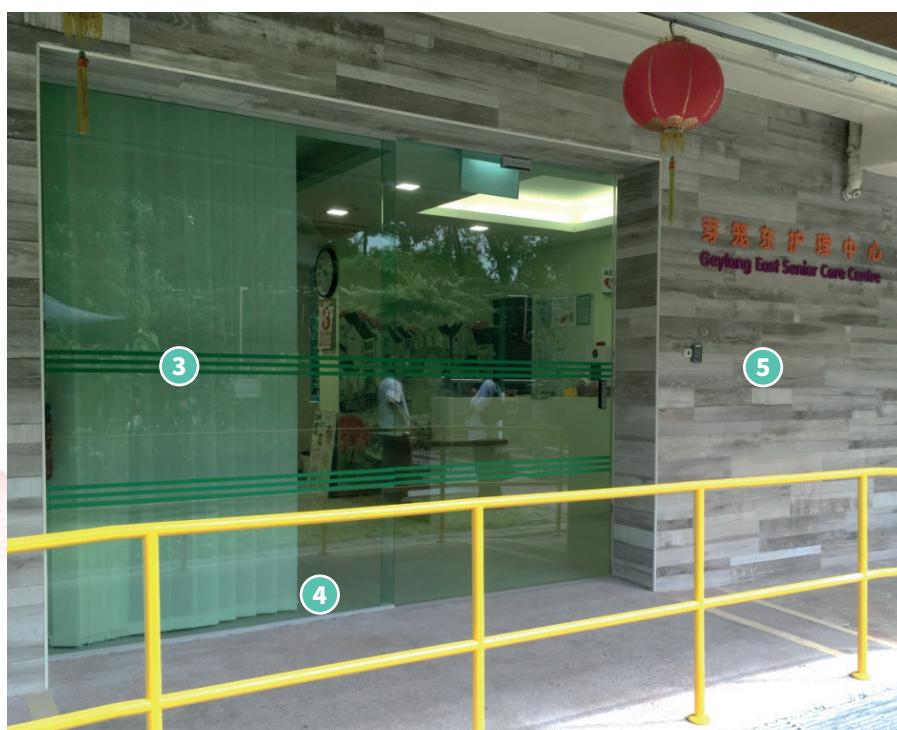


Source: SASCO @ Telok Blangah

**3** Include stickers for safety reasons to inform seniors and visitors of the glass panel, to avoid attempts to pass through it.

**4** Safe waiting area outside the eldercare premises.

**5** Controlled access at main entrance.



Source: Geylang East SCC (GEHA)

## RECEPTION COUNTERS

Height of counters i.e. reception, registration, payment should be appropriately designed for the seniors on wheelchairs to establish comfortable contact with the person behind the counter. Where seniors are required to use the countertop, ensure that it is sturdy enough to support the weight of seniors who may lean against it to rest. For seniors on wheelchair, design the counter such that handles of the wheelchair are able to fit under the countertop and there is ample legroom for senior on wheelchair to move close to the counter.

Key information such as signages and brochures should be appropriately placed at eye level.

- As seniors tend to fix their attention on the ground to watch their steps for safety, key information placed at eye level should minimally be 1.2m from floor finish level to the base of the signage.
- To also consider the appropriate eye level for seniors in wheelchair, where looking up too much or for extended periods may cause discomfort and dizziness.
- Avoid information overload and clutter by keeping it simple, short and easy to understand e.g. use icons as visual cues.



Source: Lions Home (Bishan)

**1** Ensure sharp corners are covered for safety purposes.

**3** Large clock for time orientation.

**2** Height of counter with minimum 0.76m and knee space of 0.7m for armrests of wheelchair to fit under.

## Enhancing Safety

Risk management in the care of PLWD involves assessing the PLWD's risk factors, the environmental factors and ensuring the safety of the PLWD while promoting their independence, autonomy and quality of life. Unobtrusive safety features which create an environment for safe exploration can help to reduce the risk of getting lost, disoriented or engaging in risky behaviours.

We need to change the current mind-set that a safe environment means confining the PLWD to a room with no access to other areas. For the PLWD, being confined in this way means that they have little cognitive stimulation. To encourage safe exploration within the compound, shorter

corridors and more rest areas can be introduced to cater to the frail PLWD. One possibility is to create clusters of activity areas to allow staff to have visual access of the corridors where some of the PLWD may be walking. This may encourage and prompt the PLWD to go for walks.

Other safety precautions that should be considered are: installing handrails, signage, cues and prompts; moving the entrances of the out-of-bounds areas (such as sluice rooms, store rooms, treatment rooms etc.) out of sight from the common areas so as to prevent access by PLWD and installing controlled door-access that separate the common areas and the lifts.

## LIFT LOBBIES, ENTRANCES AND EXITS

Simple design and clear signage of entrances and exits empowers PLWD to navigate easily.



Source: Vanguard Healthcare (Bukit Batok Care Home)

## Examples of camouflaged doors to reduce access to area



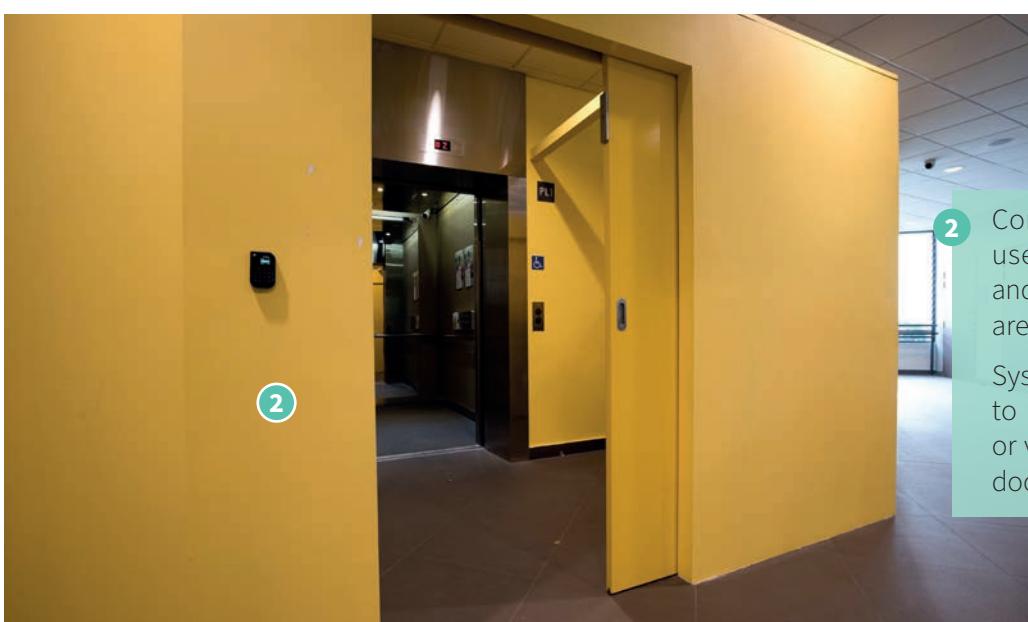
Source: Vanguard Healthcare (Woodlands Care Home)



Source: Vanguard Healthcare (Tampines Care Home)



Source: St Joseph's Home



Source: St Joseph's Home

2

Complementary colours are used to minimise attention and camouflage out-of-bounds areas.

Systems may be put in place to inform staff of any PLWD or visitor passing through the door.

## CORRIDORS, HANDRAILS AND GRILLES

### Corridors

Place seats or benches along long corridors and walkways so that PLWD and seniors who are frail are able to rest when they need to.



Source: NTUC Health Day Centre for Seniors (Henderson)

- 1 Comfortable seats and sturdy benches provide opportunities for rest between walks.

### Handrails

Handrails provide stability and support to PLWD and seniors.



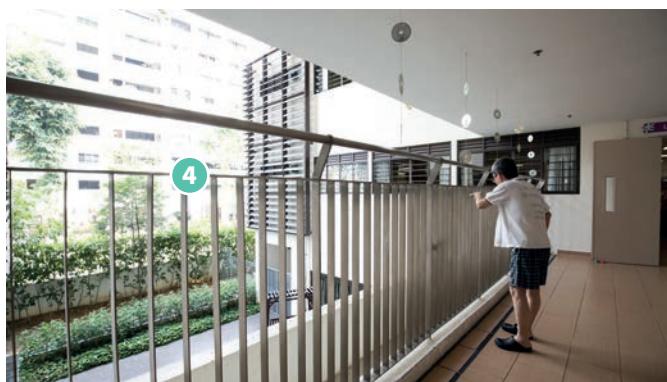
- 2 The handrail's round edge is comfortable to hold and serve the purpose in supporting PLWD.

- 3 The handrail is easy to see, contrasting in colour to the wall, floor and doorway.

Material is temperature-resistant i.e. does not change according to surrounding which may be too hot or cold to touch.

### Grilles

Grilles used should be sturdy and prevent scaling but not obstruct the view from higher floors. The design should be as homely as possible, not-easy-to scale e.g. top bar of grilles are curved inwards etc., and should avoid features that aids scalability e.g. horizontal bars, ledges etc. Invisible grilles between the railings and ceiling may be considered as an added safety precaution.



Source: Lions Home (Bishan)

- 4 Grilles used on higher floors (2nd storey and onwards) are recommended to be at least 1.5m from floor level. It should prevent scaling e.g. top bar of grilles are curved inwards and curved ledges at the bottom.



Source: Geylang East SCC (GEHA)

- 5 Railings installed at 1st storey of open terrace to prevent PLWD from exiting the premises.

## WINDOW GRILLES

Design of window grilles should be homely. Grille design should be as homely as possible to convey sense of safety and security. Ensure grilles are sturdy and do not obstruct view to the scenery outside.



Source: St Andrew's Nursing Home (Taman Jurong)

When considering the use of fixed invisible grilles, ensure that the width between the grilles are narrow i.e. less than 10cm apart so that PLWD do not get caught in the grilles.



Source: Care Corner Active Ageing Hub @ Toa Payoh East

## Chapter 2

# Bedrooms

Bedrooms are very private and personal areas. However, it is not uncommon in Singapore to have people sharing their room with at least one other member of their family. The design of bedrooms should allow for privacy and personal space. There should be a reasonable number of PLWD sharing a room with fittings and furnishings that enable the dignity of the PLWD to be maintained. The bedroom is the most private space that PLWD can find comfort in. This provides design opportunities for privacy and personalisation i.e. creating “my own space” with the bed and personal items stored around it.

Newer Nursing Homes feature the cluster concept where persons living with dementia form smaller groups which allow for closer and more personal social interaction. The cluster consists of bedrooms, toilets/ showers and common activity spaces.

The design of the bedroom should have good visual access and cues to enable PLWD to live independently and help them utilise basic amenities. For instance, there should be signage and symbols to identify the toilet. Cues such as photos and keepsakes help personalise sleeping areas and provide ease of recognition for PLWD. These design principles are applicable for home living for PLWD in the community.

## BEDROOM ENTRANCES

- 1 Signage and visual cues to enable PLWD to move around independently and be able to identify the entrance to their bedroom.

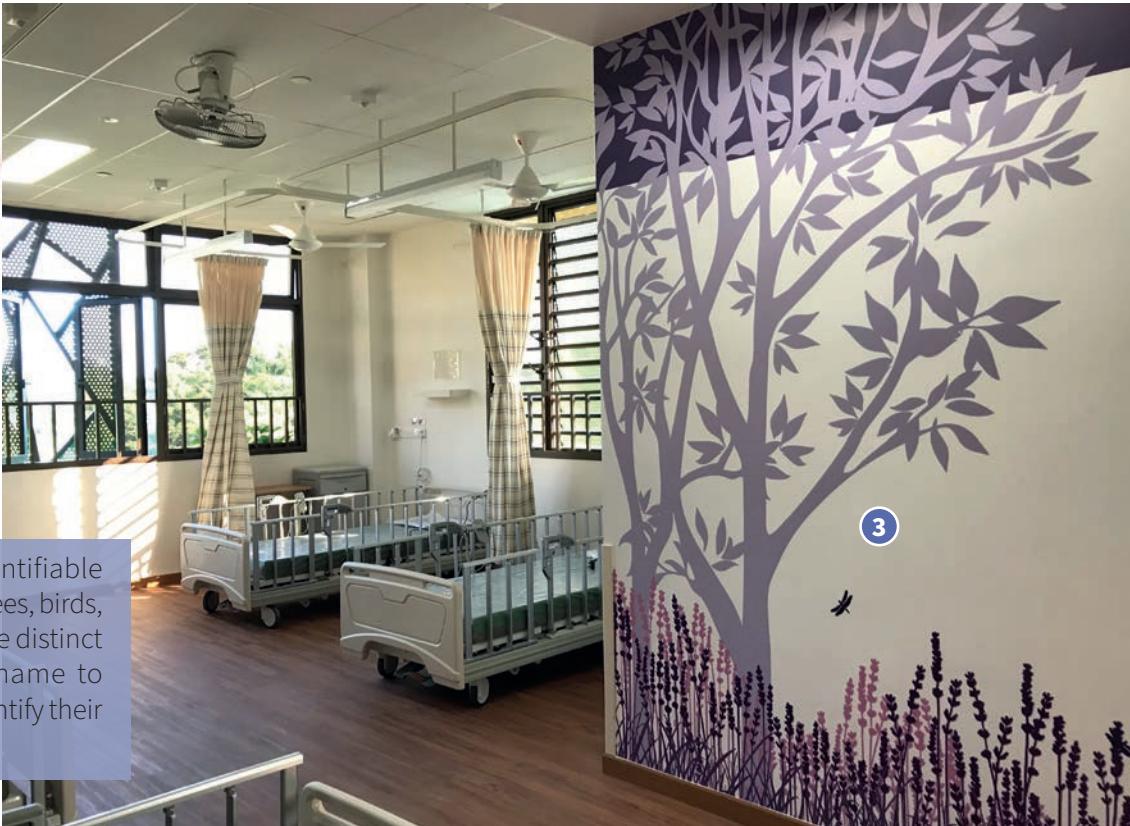
Use Positive Environment Stimuli – for example, each cluster is identified by different local fruits.

By utilising local icons or objects, the area has a visual representation that can be easily identified compared to remembering numbers or names, which do not hold meaning to the person.



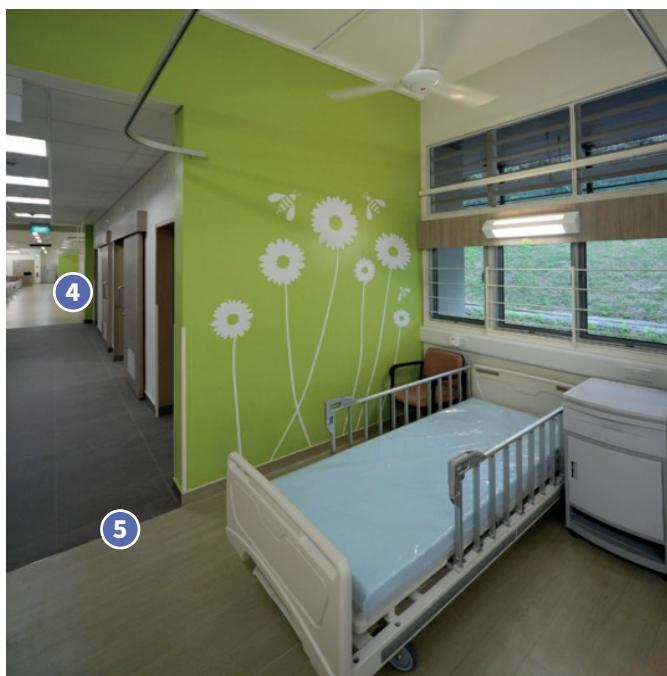
Source: The Salvation Army Peacehaven Nursing Home (Hope Centre)

- 2 The numbers on the door simulates familiar doorplates used in HDB housing. This provides local context and helps PLWD who are able to remember numbers to understand which floor and unit they are on. For those who may not be able to remember numbers, colour-coded door frames are added visual cues to help PLWD identify their bedroom.



- 3** Use easily identifiable patterns like trees, birds, flowers that are distinct and easy to name to help PLWD identify their bedrooms.

Source: St Andrew's Nursing Home (Taman Jurong)



Source: Vanguard Healthcare (Pearl's Hill Care Home)

- 4** Good line of sight to corridor, rooms and activity areas outside of bedroom to encourage PLWD to venture out of the bedroom.

- 5** Use of different flooring prompts PLWD that there is a change between spaces i.e. corridor and room. Ensure step-free access and anti-slip flooring to minimise fall risks.

- 6** Bedroom panel colour and large, easily recognisable icons help PLWD identify their bedrooms.

## BEDROOM FURNISHING AND FLOORING



Source: St Joseph's Home (Hospice)

**1** Furniture is homely, comfortable and sturdy. The sofa has wide armrests that provide comfort and support. Additional items such as a book and sensory blanket attract PLWD and provide options for meaningful activities.

**2** Shelf allows PLWD to display items which are meaningful to them. This maintain familiarity and identity in the environment.

**3** A clock in the bedroom helps with time orientation and association with activities which PLWD may look forward to.

**4** Floor is of a matte finish and does not reflect light. PLWD may perceive light reflected on the ground as wet spots and avoid them, thus contributing to fall risks.



Source: St Joseph's Home

**5** The design of the bedrooms should be sensitive to the distribution of sound. Sound from one bedroom should not be easily heard in the next room.

**6** The option of white light and warm light offers flexibility for usage.

**7** Partition design allows privacy to PLWD, when they are resting on the bed.



Source: Lions Home (Bishan)

8 Curtains create a homely atmosphere.

9 Bedsheets allow for personalization and helps PLWD recognise their beds.

10 Allow personal space to display photos and keepsakes which are meaningful to them and promote sense of familiarity and comfort.

11 Use of curtains and screens help to provide privacy. Private areas allow PLWD to spend time in solitude which may be their preference or as a way of managing stressful situations or episodes of behaviors of concern.

## Transiting from medicalised to homely environment: Pre- and post-upgrading photos of Bedrooms



Source: Ling Kwang Home for Senior Citizens

**12** Bed-facing storage space for daily items aid accessibility. Open concept allows visual access to encourage use and easy reach when needed.

**13** Personalised space features items that aid self-identity and are meaningful to them.



Pre-upgrading: Medical feel with bed frame and cabinet associated to those used in the hospitals



Source: *The Salvation Army Peacehaven Nursing Home*

- 14** Personalised bedsheets provide a more homely feel.

## Chapter 3

# Toilets and Showers

Toilets should be visible and accessible. Having visual access to the toilets reminds PLWD on the need to toilet and allows them to determine if they are able to get to the toilet independently or require assistance. Toilets that are embedded in long corridors will make it difficult for PLWD to locate them, leading to an excessive diaper use and incontinence.

Choose doors and locks that are easy to use and familiar to Singapore's context e.g. swing doors or sliding doors, equipped with grab bars on the walls for additional support. Avoid doors which require multiple actions to use e.g. slide-and-fold doors which require users to slide and swing as PLWD may not be familiar with the 2-step process nor be able to react by shifting their weight appropriately, thus increasing fall risk.

### Recommended

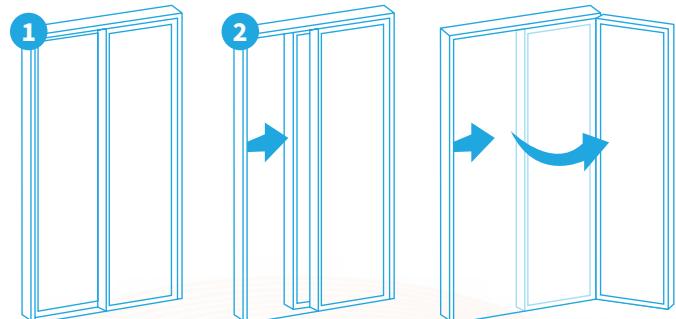
Door that operates with one-motion.

#### TIPS

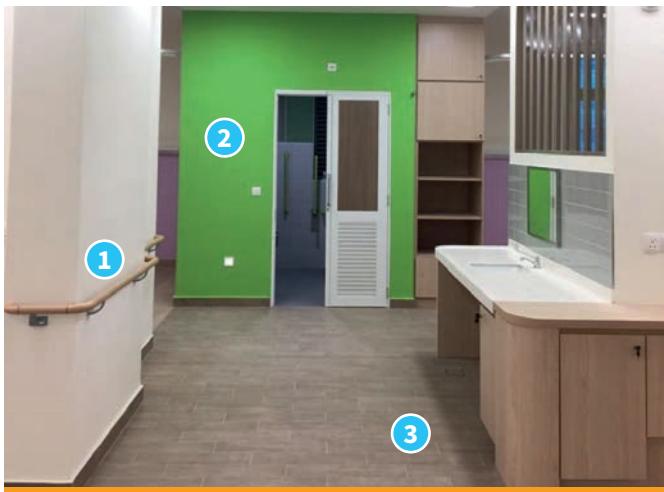
- Use doors which only require 1 action i.e. sliding doors, swing doors
- Choose mirrors which have protective laminate
- Tilted Mirror
  - ◆ To provide rounded corners with no sharp edges
  - ◆ To provide tilted mirrors for wheelchair users
- Use relaxing music and aroma diffusers to create pleasant experience

### Not Recommended

Door that requires two-action to operate.



Slide and Swing



Source: Ren Ci @ Ang Mo Kio (Nursing Home)

- 1 Handrail that contrasts with the background help PLWD to locate and use it.
- 2 Ensure clear visual access to toilet i.e. use of colour and lighting to highlight location of toilet.
- 3 Floor is matte and does not reflect light.



Source: NTUC Health Nursing Home (Jurong West)

4 Good line of sight and large visual signages contrasted against the wall to guide PLWD to the washroom.



Source: Thye Hua Kwan SCC @ Kaki Bukit

- 5 For quick identification of toilets, large vinyl sticker that contrast with the toilet door can be placed as signage. It should be visible, clear and placed at eye level.
- 6 Where possible, include text and visual illustration on how to operate the door.



Source: Vanguard Healthcare (Bukit Batok Care Home)

- 7 Use of different flooring prompts PLWD that there is a change between spaces i.e. corridor and room. Ensure step-free access and anti-slip flooring to minimise fall risks.
- 8 Clear signage with visual cues help PLWD locate particular rooms more easily i.e. placing an icon of person showering on the bathroom door acts as a prompt to the purpose of the room.



Source: St Luke's ElderCare Kebun Baru Centre

- 9** Mirror should be slightly angled to provide visibility for wheelchair users.
- 10** Ensure that the height of the sink is comfortable for wheelchair users and that the sink has rounded corners.
- 11** Ensure tap is of a recognisable fixture and easy to use. The tap lever and soap dispenser should be within reach of wheelchair users.
- 12** Wall and floor tiles have strong colour contrast. Ensure flooring is anti-slip and non-reflective.
- 13** Use flush button with colour contrast rim and icon for visibility and to encourage use of flush system. Ensure button is easy to press.
- 14** Good contrast of colours for toilet features to be easily seen.  
The toilet seat cover and lid is in a different colour from that of the toilet bowl. The colour of the toilet bowl is also differentiated from that of the floor.
- 15** Grab bars to have colour contrast for PLWD to identify them easily and use them.
- 16** A call button/pull chord is installed next to the toilet in case of an emergency.



Source: NTUC Health Day Centre for Seniors (Geylang East)

17

18

17

Good contrast of colours of the grab bars against the wall.

Ensure that the grab bars are securely fixed to the wall. Material of grab bar is not cold to touch and has grooves which has anti-slip properties.

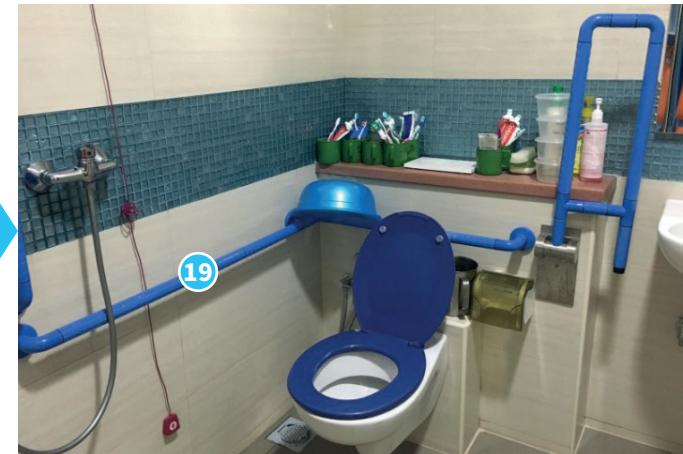
18

Use hand-held shower head to allow easier assistance with showering.

### Pre- and post-upgrading photos of the toilet at Ling Kwang Home for Senior Citizens



Source: Ling Kwang Home for Senior Citizens



19

Grab bars should be of an appropriate height i.e. between 0.8m to 0.9m (840-915mm from floor level) for seniors and placed beside the toilet bowl for support.

## Chapter 4

# Therapeutic Activity Spaces

Therapeutic activities for PLWD include personal care, domestic activities, work-like activities, recreation, social gatherings and solo activities. Activities which the PLWD participate in should be meaningful to them and are cognitively stimulating, which helps to maintain function and cognition as well as moderate their mood and behaviour.

A variety of activity spaces should be available to allow PLWD to participate in solo activities, small group activities (6-8 individuals) and large group activities. All spaces meant for activities should empower the PLWD to participate in activities and facilitate positive interactions among them.

## ENABLING ENVIRONMENTS

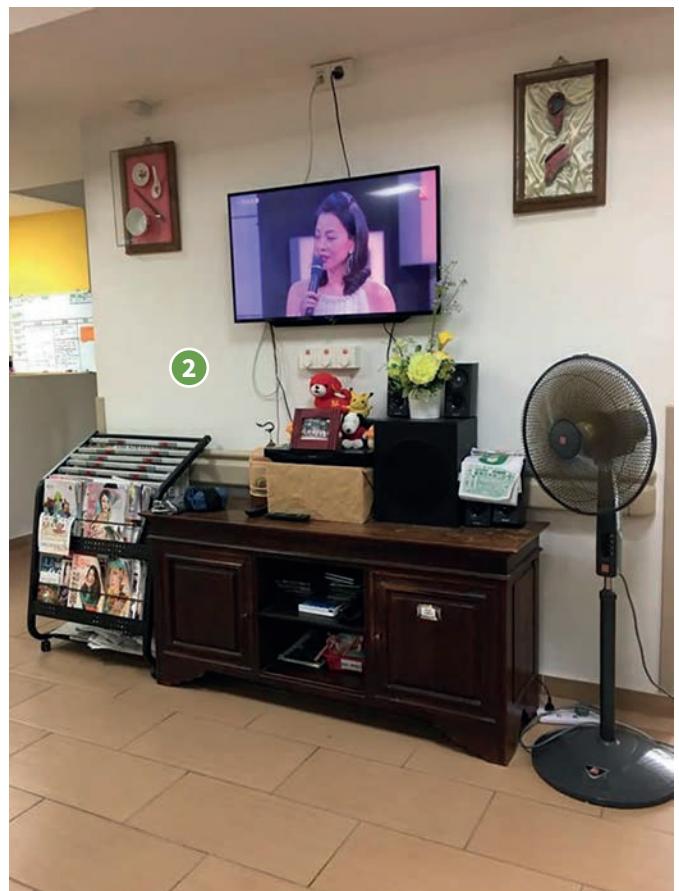
The space should be unobstructed (e.g. by pillars and dividers) to allow for full visual access of the space. Providing a “living room” area can promote a sense of comfort and a homely feel. The use of an orientation clock or similar activity schedules helps PLWD with time orientation and associating activities with specific time of the day.



Source: NTUC Health Day Centre for Seniors (Chai Chee)

**1** Orientation clock with visual cues and text describes the activities for the day in the Day Centre.

**2** Create homely and culturally familiar environment so that PLWD feel secure and are comfortable in the environment.



Source: Lions Home (Bishan)

The therapeutic activity space should be of an appropriate size for various (small) activity groups to cater to the different interests of the PLWD. The space should be designed to facilitate interaction between the activity facilitator and PLWD and allow for direct visual access to other facilities such as the toilets.



Source: Apex Harmony Lodge



Source: Ling Kwang Home for Senior Citizens

4 Windows allow for natural daylight to illuminate the interior.

5 Provide options for large group gathering and small private activity area for PLWD to sit by themselves.

6 Organise PLWD into small groups based on their shared interests and activities.



Source: Apex Harmony Lodge



7 Option for PLWD who wishes to be alone to engage in activity of their choice or to observe the main group at the side.

Source: Lions Home (Bishan)



Source: Lions Home (Bishan)

8 Use of cushions on the seats to provide more comfort for PLWD. Keep items which are meaningful and important to the PLWD close to them.

9 Friends who are familiar with each other can be seated together but are engaged in different activities of their choice.



Source: St Joseph's Home



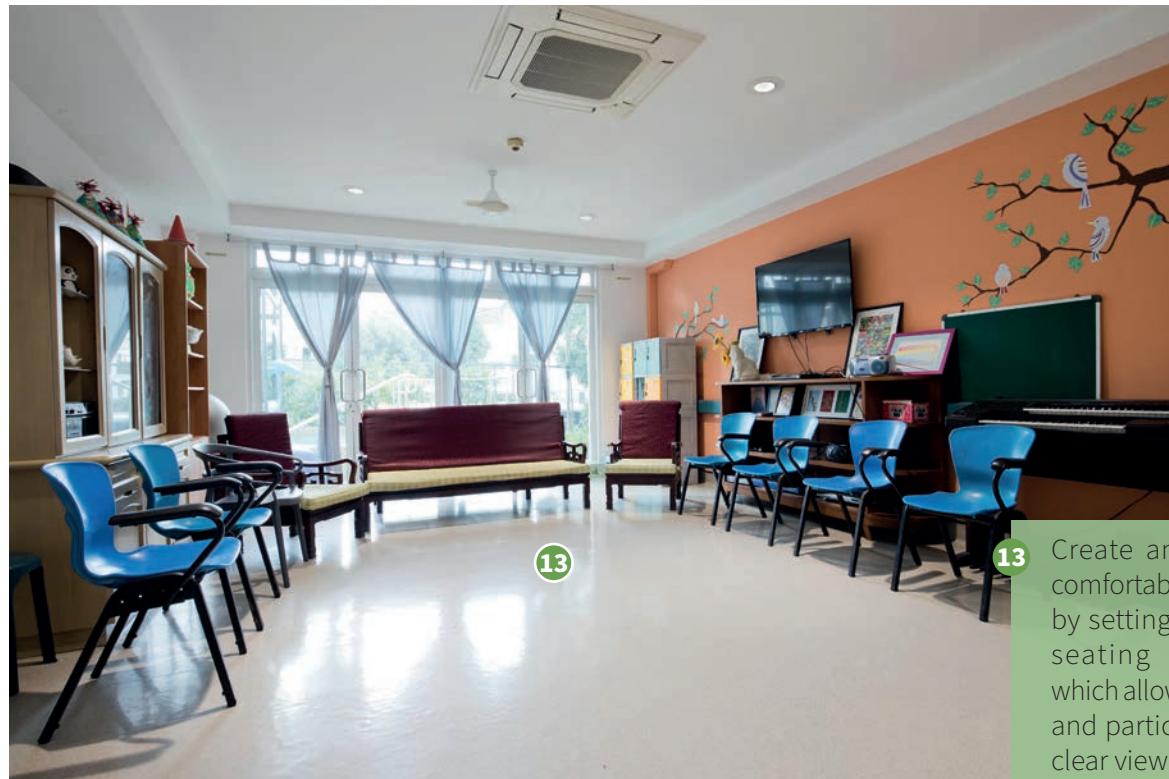
- 10** Height of table (minimum 0.76m) is appropriate to allow for armrests of wheelchairs to fit underneath, allowing seniors to sit closer. It facilitates intergeneration activities as the height of the table is optimal for preschoolers to reach for items on the table top and engage the senior.

- 11** Curved design of the table allows for seniors to sit closer and more comfortably.

- 12** Options available for individual activities or to observe from the parameters if the senior does not wish to engage in the planned group activities.

Therapeutic activities help PLWD to maintain their skills and also provide a sense of purpose, maintain their well-being and provide opportunities for positive engagement and social connection. Encouraging PLWD to initiate and participate in activities helps promote independence and stimulation of their physical mind and body.

Wherever possible, PLWD should be allowed to choose the activities they prefer and be given access to materials and spaces to perform these activities without compromising safety. Equipment that may be dangerous or require assistance to use may be stored in locked and concealed storage spaces that blend in with the design of the walls.



Source: The Salvation Army Peacehaven Nursing Home

- 13** Create an inviting and comfortable environment by setting up a U-shape seating arrangement which allows the facilitator and participants to have clear view of each other.

## Chapter 5

# Sensory and Reminiscence Areas

Suitable sensory activities should be available and provided for PLWD to meaningfully engage them. For these activities to be meaningful, the activities should relate to their past and reflect their background relevant to their self-identity.

## SENSORY AREAS

Sensory areas are conducive safe spaces equipped to provide multi-sensory stimulation, with the primary purpose of providing meaningful engagement through sight, sound, touch, taste, smell and movement. The right amount of stimulation helps to relieve stress and boredom, facilitate active engagement and communication, and enhance feelings of comfort and well-being. Design and equipment used in sensory areas should also be age appropriate and relevant to the PLWD.



Source: Vanguard Healthcare (Bukit Batok Care Home)



Source: Vanguard Healthcare (Bukit Batok Senior Care Centre)

## REMINISCENCE AREAS

Create areas which are familiar and appropriate to the age group and culture of the PLWD, such as “kopitiams” (traditional coffee shops), hair salons and grocery minimarts so that they may be reminiscent of activities they used to do in the past.



Source: Lions Home (Bishan)

1 Harness the existing abilities of PLWD and provide them with sense of purpose with tasks and duties that they enjoy doing.



Source: Lions Home (Bishan)



2 Create homely feel with familiar items so that PLWD are comfortable and able to relate to familiar items.

Source: ADA New Horizon Centre (Tampines)



Source: NTUC Health Nursing Home (Chai Chee)





Source: The Salvation Army Peacehaven Jade Circle Arena



Source: Society for the Aged Sick

## HAIR SALONS



Source: St Joseph's Home

## TRADITIONAL PROVISION SHOP FRONT AND MINI-MARTS



Source: Vanguard Healthcare (Pearl's Hill Care Home)

## THEATRE SPACE

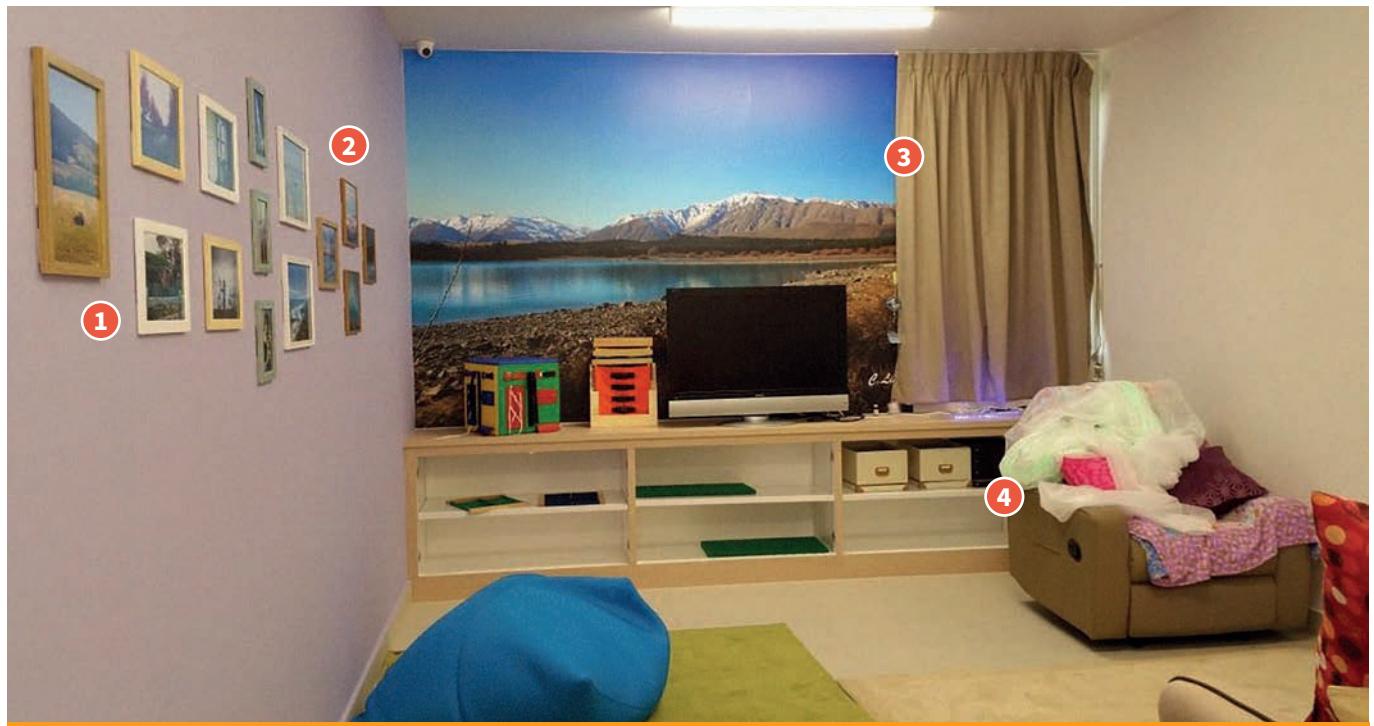


Source: Vanguard Healthcare (Bukit Batok Senior Care Centre)

## Chapter 6

# Quiet Spaces

Quiet rooms are important in providing privacy and may be used for purposes such as private areas for counselling, bereavement and terminal care. The provision of a quiet room allows for the control of stimuli. This is likely to reduce overstimulation, irritability and potentially aggressive behaviour of the PLWD.



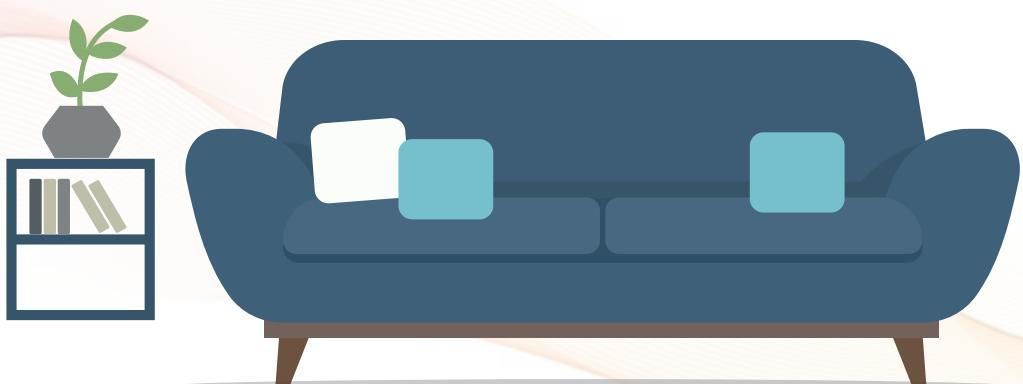
Source: NTUC Health Day Centre for Seniors (Chai Chee)

**1** Photo frames on the wall may contain pictures that can help PLWD reflect or can serve as conversation starters.

**2** Soft and warm colours such as pastel hues set the tone for a warm and relaxing ambience.

**3** Use curtains to create a homely feel and to shut out unwanted stimuli, e.g. wall murals, sunlight, overly bright lights, etc.

**4** Provide textile cloth, blankets and fabric materials for sensory use.



**5** Colour contrast of furniture against the wall and the floor to help define the furniture, making it easier for PLWD to locate and use.

**6** Provide seats for 2 – 3 people for small group social gatherings or option to spend some quiet time alone. A quiet room can be used by family members/visitors to provide private social spaces.

Source: NTUC Health Day Centre for Seniors (Chai Chee)



Source: The Salvation Army Peacehaven Nursing Home

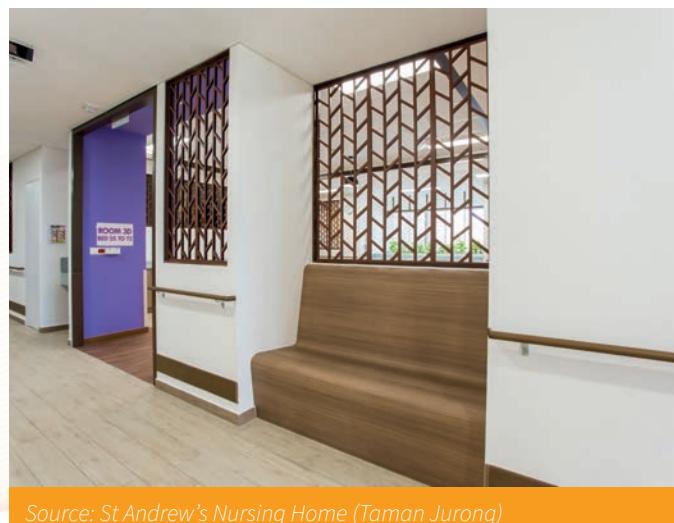
Transform corners of corridor into quiet spaces with seat provision for PLWD seeking privacy.



Source: The Salvation Army Peacehaven Nursing Home

**7** Provide option for quiet spaces where PLWD can spend some private and comfortable time with their family members and visitors.

**8** Where feasible, window view looks out to greenery which may help to calm PLWD's anxieties.



Source: St Andrew's Nursing Home (Taman Jurong)

## Chapter 7

# Dining Areas and Dry Pantries

In Singapore, eating together is a form of social activity that strengthens friendships, crafts memories and celebrates relationships. For elderly Singaporeans who have grown up on local cuisine and intricate traditional meals, meals do not just serve a physical need but also plays a large part in making social connections and fulfilling a cultural need.

Smaller groups (~4-6 people) are suitable for PLWD to engage in conversations. Less distractions, confusion and disorientation will allow PLWD to focus on the meal. It will also reduce the need for staff to take over feeding which would lead to PLWD's loss of independence.

The design of the dining table and arrangement (e.g. round or square table for 4-6 people) can create an environment that encourages social interaction and make dining an enjoyable experience.



Source: NTUC Health Nursing Home (Jurong West)

Singapore's multicultural diversity is reflected in the variety of local cuisine (Chinese, Malay and Indian). Where possible, the menu should include a range of food for the PLWD to choose from. Providing meals that are well presented is likely to augment the meal time experience and ensure that the PLWD fulfill their nutritional needs.

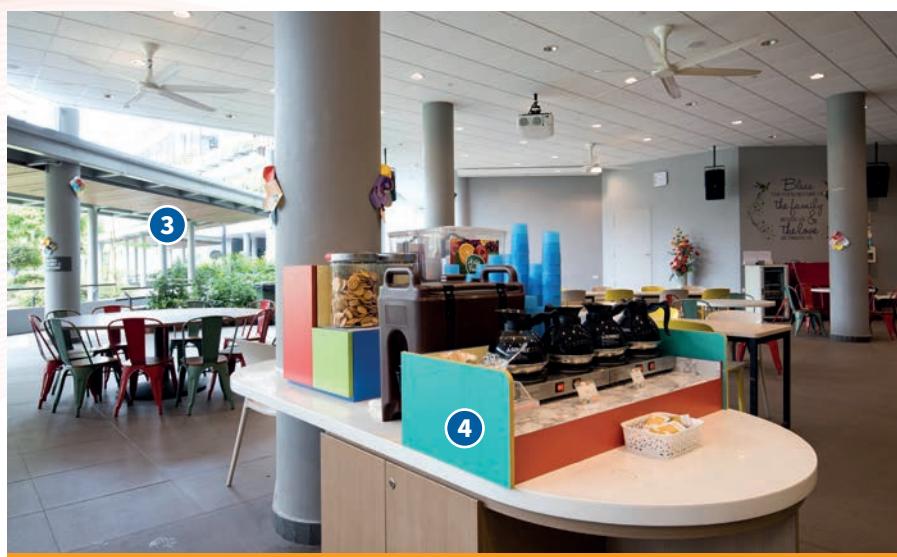
A dry pantry could be included in the living space (e.g. dining area or activity hall) for PLWD to prepare their own drinks and snacks. Finger food should be made available as an option when PLWD refuses the main meal.



Source: Lions Home (Bishan)

#### TIPS

- Place items in sequence to prompt next steps e.g. placing the drying rack beside the sink so that PLWD can place dishes that have been washed on the drying rack. Ensure there is colour contrast to help with depth perception and judgement.
- Provide items for PLWD to facilitate self-service e.g. placing cups near water tumblers, put up step-by-step instructions for PLWD preparing their beverage. Ensure area is well-lit.



Source: St Joseph's Home



Source: Apex Harmony Lodge

**3** Allow for ample daylight into the area where possible.

**4** Light snacks and beverages available at the dining area.

**5** Food choices are laid out and labeled to facilitate PLWD to choose from the selection and serve themselves.

## Therapeutic Gardens and Outdoor Spaces

Exposure to a garden environment is beneficial to PLWD with reductions in agitation, pacing and frequency of medicine. Gardens and outdoor spaces also provide opportunities for sensory stimulation and experiences through:

- Sight (colours of flowers)
- Smell (scent of plants)
- Hearing (biodiversity)

Meaningful activities and social engagement can be encouraged through the use of culturally familiar chairs and tables as seen in void decks and wheelchair accessible planter boxes. Similar gathering points can be created using gazebos, garden benches, etc, as rest stops for PLWD to socialise or enjoy garden views.

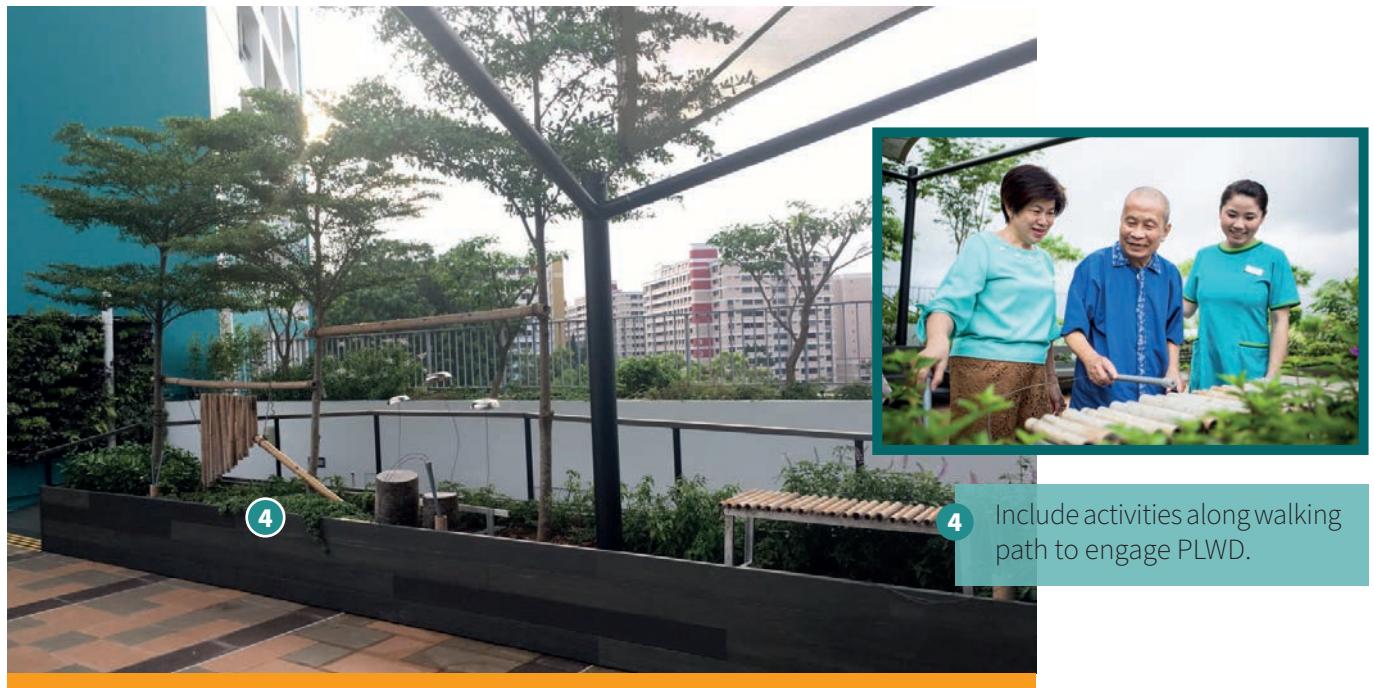


Source: Jamiyah Nursing Home

**1** Clear visual access to toilets.

**2** Well-defined path that is colour-contrasted against the grass patch. Path is wide enough to allow for 2 wheelchairs to pass through (1.8m).

**3** Variety of seating choices for small group gatherings. Parasols can be used to provide shade where there are no natural greenery or trees.



Source: NTUC Health Nursing Home (Jurong West)



Source: NTUC Health Nursing Home (Jurong West)

**5** Highlight the edge of step to indicate any changes in floor level.

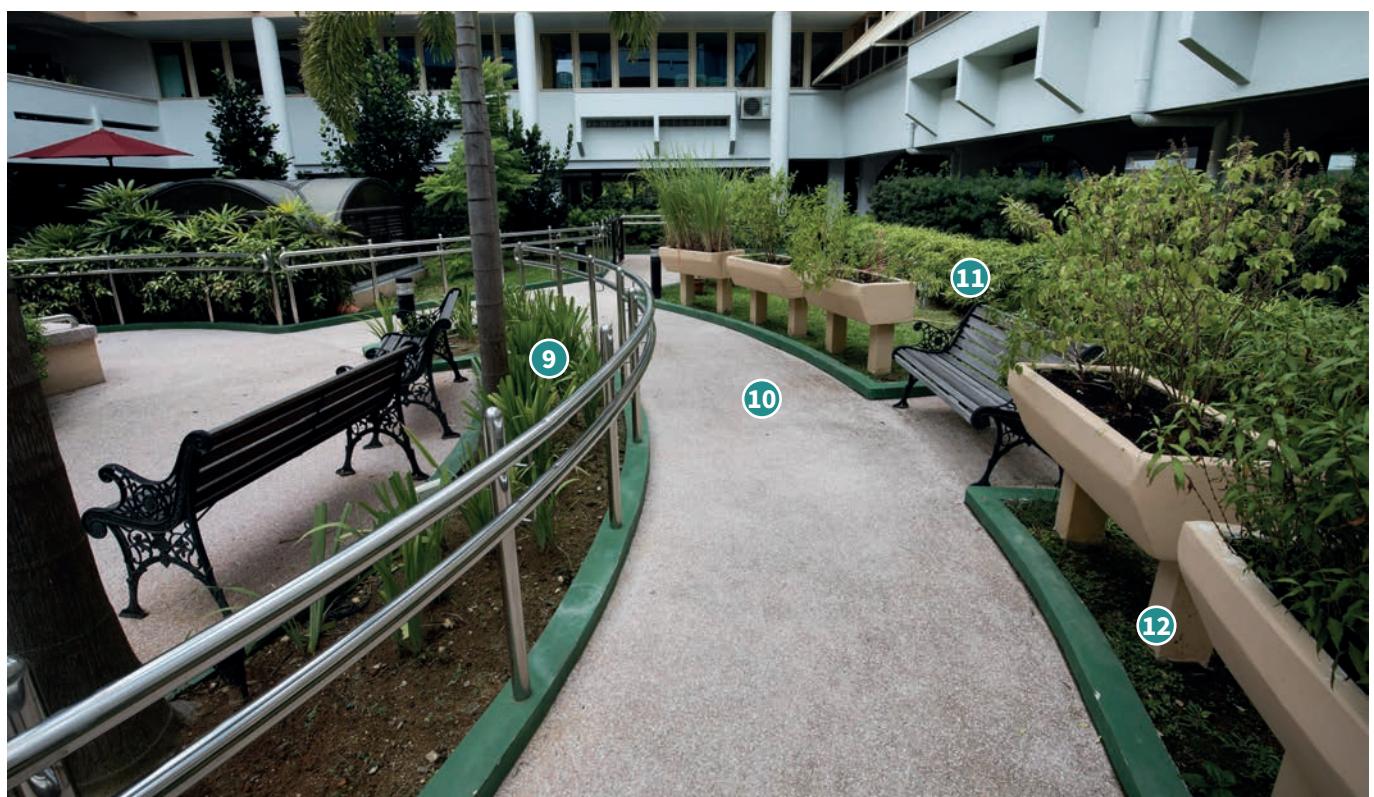
**6** Use different flooring textures for sensory stimulation.

**7** Ensure handrail is positioned at a suitable standing height (i.e. between 0.75m to 1m), resistant to temperature and comfortable to hold i.e. not hot to touch in the afternoon or too cold to touch in the night.



8 Closed-circuit path allows for safe and easy navigation.

Source: Ling Kwang Home for Senior Citizens



Source: Ling Kwang Home for Senior Citizens

9 Handrails for support along walkways.

11 Sturdy benches for rest between walks.

10 Colour contrast to indicate between kerb and path.

12 Planters suitable for both standing and seated in wheelchair positions.



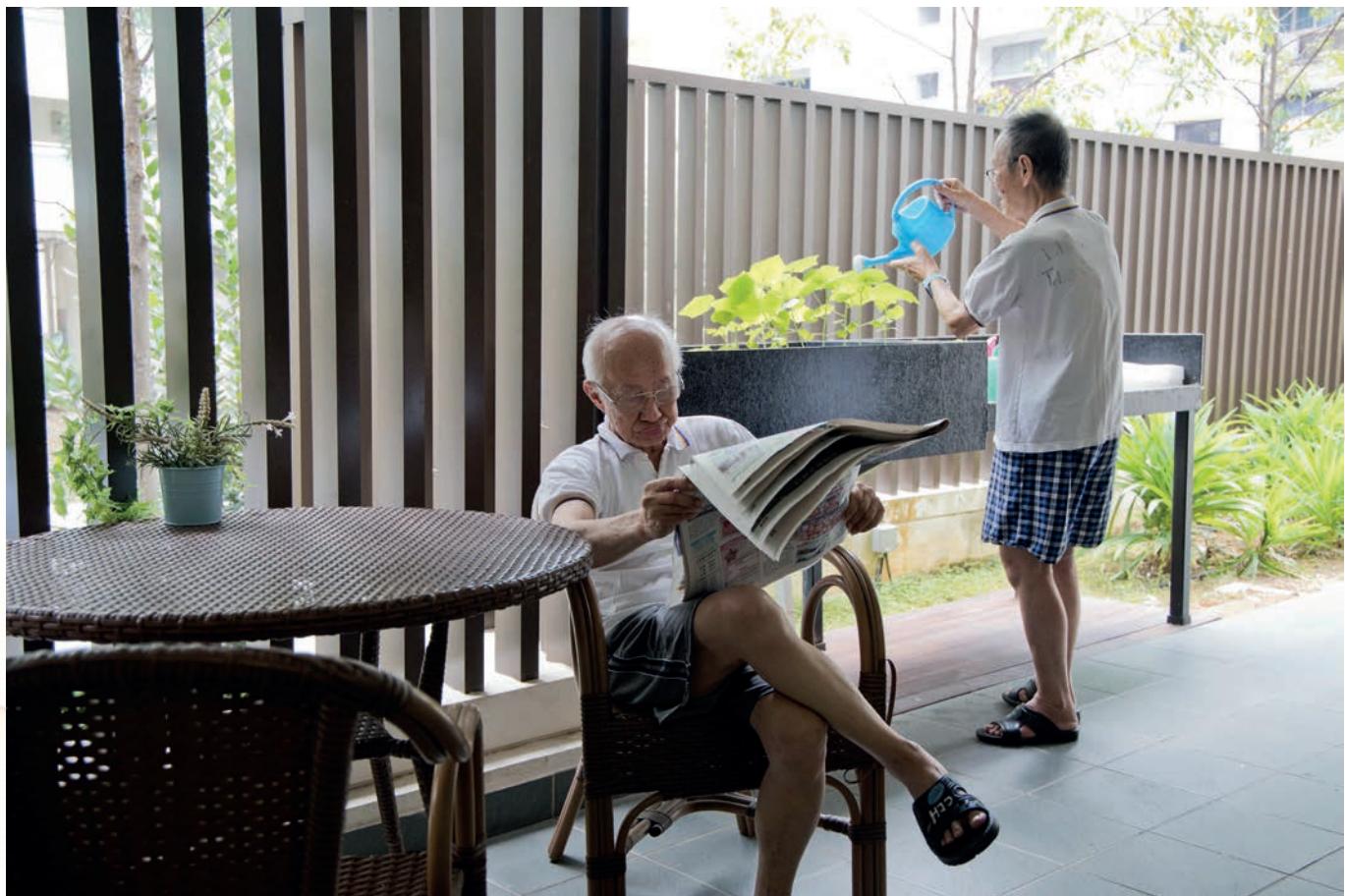
Source: Ling Kwang Home for Senior Citizens



**13** Outdoor spaces for small gatherings.

**14** Use of water features provide added visual and auditory stimulation which can be therapeutic.

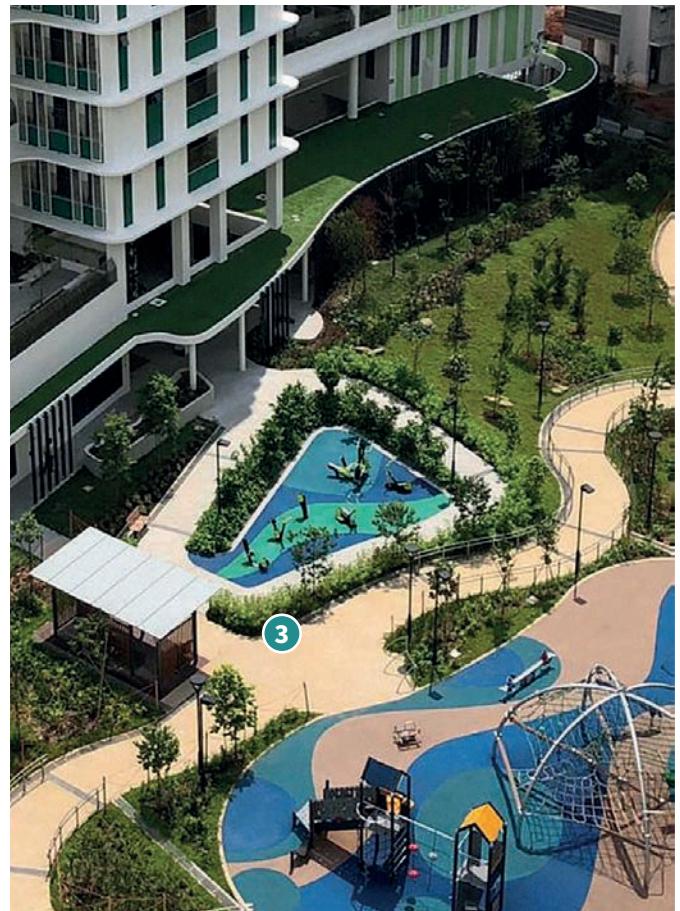
Where outdoor spaces are limited, consider creating smaller green spaces in balconies, by the windows or using indoor plants.



Source: Lions Home (Bishan)

## SENIOR-FRIENDLY OUTDOOR AREAS

### Fitness Area



Source: Vanguard Healthcare (Bukit Batok Care Home)

**1** Fitness equipment are colour-contrasted against the tactile floor for easy identification. Ensure material is weather- and temperature-resistant i.e. not hot to touch in the afternoon and too cold in the night.

**2** Ensure barrier-free access along walking paths and if there are level differences, highlight the curb/ step for visibility.

**3** Use of plants and bushes instead of fences to define spaces. Clearly defined paths allow for easy navigation.

## Intergenerational Play Area

Seniors can benefit from intergenerational bonding with increased participation in activities with children and reduces loneliness. Provide spaces and options where intergenerational engagement can take place safely.



Source: St Joseph's Home



Source: St Joseph's Home

# Applying Dementia-Friendly Design Principles in Singapore in accordance to International Best Practices

The design of the environment for people living with dementia (PLWD) is a complex process that involves a multitude of stakeholders. Principles of design are crucial in the design process as they enable and empower users to engage in evidence-based best practice. It draws users into a critical thinking process, as they work through key design considerations that are vital to enhancing the quality of life and care of the PLWD, residents, staff and family. It also provides an invaluable platform of communication among stakeholders, creating an alignment of ideas, while enhancing the process of informed decision making.

The six principles of design developed in collaboration with stakeholders in Singapore is also very much aligned with international best practice standards set out by Mary Marshall and later refined by Richard Fleming (Marshall, 2001; Fleming, 2011; Fleming & Bennett, 2015). Unpacking the six principles of design in comparison to the principles of design for dementia enabling environments, both sets of principles highlight the need for safe, homely, culturally familiar environments that contain appropriate levels of stimulation for PLWD.

Based on the design principles, these inclusive spaces seek to promote empowerment and autonomy; ensuring the environment facilitates engagement and mobility. Both sets of principles also address the need for privacy, respecting the need for personal space for PLWD. Lastly, the principles of design in Singapore address the needs of PLWD by highlighting the need for meaningful participation. The principles, are overarching, and encompass the need for designs to be inclusive of the wider community and personal activities.

## References

- Fleming, R. (2011). An environmental audit tool suitable for use in homelike facilities for people with dementia. *Australasian Journal on Ageing*, 30(3), 108-12. doi:10.1111/j.1741-6612.2010.00444.x. Epub 2010 Jul 19. PubMed PMID: 21923702.
- Fleming, R., & Bennett, K. (2015). Assessing the quality of environmental design of nursing homes for people with dementia: Development of a new tool. *Australasian Journal on Ageing*, 34(3), 191-194. doi:10.1111/ajag.12233
- Marshall, M. (2001). Environment: how it helps to see dementia as a disability. *Care Homes and Dementia: Journal of Dementia Care*, 6, 15–17.

# Introduction to the Singaporean Environment Assessment Tool (SEAT)

The SEAT provides a systematic framework for reviewing environments for people living with dementia and identifying areas for improvement. It contains questions that have been designed to gather information on how well the ten principles described below have been put into practice.

The SEAT is designed to be used by a non-design professional and can be completed by a member of staff or a person visiting the facility with minimal knowledge of dementia care. However, it is important that the person completing the SEAT is familiar with the design principles underpinning it prior to starting the assessment. Users should familiarise themselves with the principles by thoroughly reading the description of the principles in the user guide before attempting. The user guide can be accessed on AIC's website at <https://aic.buzz/mh-resources>.



## SINGAPOREAN ENVIRONMENT ASSESSMENT TOOL (SEAT)

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Name of Assessor : \_\_\_\_\_

Name of the Site : \_\_\_\_\_

Type of Site : \_\_\_\_\_

Date : \_\_\_\_\_

Time : \_\_\_\_\_

Are you assessing  
(Please select)       Facility       Unit       Floor/Ward

Year Built (Facility) : \_\_\_\_\_

Year Built (Area Assessed) : \_\_\_\_\_

# Contents

## Singaporean Environment Assessment Tool (SEAT)

**51**

**1. External Spaces**

**52**

**2. Internal Spaces**

**54**

**4. Dining & Kitchen/Pantry**

**53**

**3. Living/Activity Space**

**55**

**5. Bedrooms**

**56**

**6. Bathroom & Toilets**

**56**

**7. Design in response to vision for way of life**



# 1. External Spaces

**Mark only one box per row.**

No.	Question	N/A	No	Yes	If Unobtrusive
1.1	Can people who live in the unit be prevented from leaving the garden/outside area by getting over or under the perimeter? (Only applicable to nursing homes that have a secured perimeter.)	N/A	0	1	1
1.2	Can people who live in the unit be prevented from leaving the garden/outside area through the gate? (Only applicable for nursing homes that have a gate at the entrance or exit to the facility.)	N/A	0	1	1
1.4	Outside, is there step free access to all areas?	N/A	0	1	
1.5	Outside, are all floor surface materials safe from being slippery when wet?	N/A	0	1	
1.6	Outside, is the path surface even?	N/A	0	1	
1.7	Outside, are the paths that are exposed to external elements such as the weather, plants and trees; clear of obstacles (e.g. trees, thorny plants) along and over the path?	N/A	0	1	
1.8	Outside, are the paths wide enough to allow two wheelchairs to pass? (Minimum width is 1.8 metres)	N/A	0	1	
1.9	Outside, are all ramps of a gradient suitable for wheelchair use?	N/A	0	1	
3.10	Can a garden or outside area for the PLWD be seen from where staff spend most of their time?	N/A	0	1	
5.15	Outside, are a variety of materials and finishes used to create an interesting and varied environment for a person living with dementia and help them know where they are (e.g. brick, timber stone, grass)?	N/A	0	1	
5.16	Outside, are olfactory cues (such as perfumed plants) used to provide a variety of experiences for a person living with dementia and help them know where they are?	N/A	0	1	
5.17	Outside, are auditory cues used to provide a variety of experiences for a person living with dementia and help them know where they are (e.g. wind chimes)?	N/A	0	1	
6.2	Outside, is there a path that guides PLWD past areas that might invite participation in an appropriate activity?	N/A	0	1	
6.3	Outside, is there a choice of activities for PLWD to participate in (such as sorting tools, seeing birds, gardening)?	N/A	0	1	
6.4	Outside, are there chairs or benches at frequent intervals so people can sit and enjoy the fresh air?	N/A	0	1	
6.5	Outside, are there both shady and sunny areas along the path?	N/A	0	1	
6.6	Outside, does the path allow PLWD to be taken past a range of activities that they can passively participate in (such as looking at plants, watching birds)?	N/A	0	1	
6.7	Are there verandas or shaded seating areas in close proximity to the building?		0	1	
8.5	Outside, are there places in the garden or outdoor area where a person can be on their own and/or in private conversation?		0	1	

Note:

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Note: The numbers in the first column are not in running order. These numbers correspond to the design principle in SEAT and its line item i.e. 1.2 refers to the 1st design principle in SEAT relating to Safety and 2 refers to the 2nd statement under the indicated design principle. To facilitate users during their assessment, the statements have been categorised by locations.

## 2. Internal Spaces

**Mark only one box per row.**

No.	Question	N/A	No	Yes	If Unobtrusive
1.3	Can the front door leading out of the unit be secured?	N/A	0	1	1
1.17	Is technology utilised to enhance the safety and security of the unit? (Key card access, digital locks, sensors etc.)	N/A	0	1	1
1.13	Inside, are all floor surfaces safe from being slippery when wet?		0	1	
1.14	Inside, is contrast between floor surfaces avoided (e.g. sharp distinction between bedroom floor and corridor)?		0	1	
1.15	Inside, are all ramps of a gradient suitable for wheelchair use?		0	1	
1.16	Is it easy to transfer a non-ambulant person from their bed to the bathroom (using appropriate equipment)?		0	1	
No.	Question	1-10	11-16	17-29	30+
2.1	How many people live in the unit?	Score 3	Score 2	Score 1	Score 0
No.	Question	N/A	No	Yes	
2.2	Does the scale (height and width) of the common areas allow a person to feel comfortable (and not uneasy because they are too big or too small)?		0	1	
4.1	Are doors to cleaner's cupboards, storerooms and other areas where PLWD may find danger easily seen?		1	0	
4.3	Is there a public address, staff paging or call system with bells, loudspeakers or flashing lights in use?		1	0	
4.4	Does the noise from closing doors disturb PLWD, (e.g. flapping kitchen doors, noisy automatic doors)?		1	0	
4.5	Is there a lot of visual clutter in the unit (i.e. notices, objects, furniture that are either irrelevant to PLWD or make it hard for them to interpret their environment)?		1	0	
4.6	Inside, can glare be avoided by using curtains and blinds?		0	1	
5.1	Does each room have a distinctive character and feel? e.g. is it easy to identify a room as a dining room or a living room?		0	1	
5.11	Inside, are contrasting materials used so that edges of surfaces and objects can be easily seen (e.g. coloured borders, different floor, wall and ceiling colour)?		0	1	
5.12	Inside, are olfactory cues (such as perfumed flowers or kitchen smells) used to provide a variety of experiences for a person living with dementia and help them know where they are?		0	1	
5.13	Inside, are tactile cues used to provide a variety of experiences for a person living with dementia and help them know where they are (e.g. different floor finishes, fittings such as door handles)?		0	1	
5.14	Inside, are auditory cues used to provide a variety of experiences for a person living with dementia and help them know where they are (e.g. music, sound of a water feature)?		0	1	
5.18	Inside, is there an attractive view to outside from the living and/or dining room for a person seated or lying down?		0	1	
5.5	Are different corridors clearly recognisable so PLWD can identify where they are?	N/A	0	1	
6.1	Is there a clearly defined accessible path that avoids dead ends and locked exits and guides the PLWD from inside to outside and back to their starting point?	N/A	0	1	
6.8	Inside, is there a path that guides PLWD past areas that might invite participation in an appropriate activity (such as folding clothes, listening to music)?		0	1	
6.9	Inside, does the path take PLWD past chairs that provide opportunities for rest and/or conversation?		0	1	

Note:

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### 3. Living/Activity Space

**Mark only one box per row.**

No.	Question	N/A	No	Yes		
3.8	Can the living room that is used by most PLWD be seen into from where staff spend most of their time?	N/A	0	1		
5.4	Is the living room clearly recognisable from outside the room?	N/A	0	1		
8.6	Does the living room provide opportunities for people to be in private conversation?	N/A	0	1		
No.	Question	N/A	None	A Few	Many	
7.1	Are there any pieces of furniture in the living room that are of a design that are not familiar to the majority of PLWD?	N/A	2	1	0	
No.	Question	No	1	2 or more		
8.1	Within the unit, are there places where a small group of people can gather?	0	1	2		
No.	Question	No	1	2	3 or more	
8.2	Within the unit, are there places where a person can be on their own and/or in private conversation (e.g. nooks, sitting areas)?	0	1	2	3	
No.	Question	1	2-3	4 or more		
8.3	How many different types of spaces are there within the unit (e.g. cosy living, TV room, activity space)?	0	1	2		
No.	Question	None	25% or less	26% - 50%	51% - 75%	76% or more
7.7	Are there resources for PLWD to engage in spiritual or religious activities?	0	1	2	3	4
No.	Question	No	Yes			
9.1	Is there easy access to places which encourage interaction and engagement with the wider community (e.g. children, knitting groups, religious groups)?	0	1			
9.2	Is there a room where families can share meals and/or celebrations with their relatives?	0	1			
9.4	Is there an easily accessible place where families and friends can feel comfortable while taking a break from visiting, (e.g. when visiting a very sick person)?	0	1			
9.5	Is there access to computers, for PLWD utilising technology for engagement or communication (e.g. videoconferencing with family and friends, making video calls, surfing the internet, sending emails etc.)?	0	1			
7.5	Is the room or rooms able to support the spiritual or religious practices of the PLWD?	0	1			
9.6	Can a small group of people gather privately?	0	1			
9.7	Is there access, space and privacy for families and friends visiting relatives requiring palliative care?	0	1			

Note:

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## 4. Dining & Kitchen/Pantry

**Mark only one box per row.**

No.	Question	N/A	No	Yes	If Unobtrusive
1.10	Is there a way to keep PLWD out of the kitchen/kitchenette/dry pantry if required?	N/A	0	1	1
1.11	Can appliances be locked away in the kitchen the PLWD use? (Applicable to homes providing PLWD to kitchenette/dry pantry to engage in activities of daily living.)	N/A	0	1	1
1.12	Is there a switch to turn off electricity to power points in the kitchen the PLWD use? (Applicable to homes providing PLWD to kitchenette/dry pantry to engage in activities of daily living.)	N/A	0	1	1
3.4	Can the exit to a garden or outside area be seen from the living or dining room that is used by most PLWD?	N/A	0	1	
3.5	Can the dining room be seen into from the living room?	N/A	0	1	
3.9	Can the dining room that is used by most PLWD be seen into from where staff spend most of their time?	N/A	0	1	
5.2	Is the dining room clearly recognisable from outside the room?	N/A	0	1	
8.4	Does the dining room allow for a choice to eat alone?		0	1	

Note:

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## 5. Bedrooms

**Mark only one box per row.**

No.	Question	25% or less	26% - 50%	51% - 75%	76% or more
3.1	What percentage of PLWD can see the inside of a living room as soon as they leave their bedroom?	0	1	2	3
3.2	What percentage of PLWD can see their bedroom entry as soon as they leave a living room?	0	1	2	3
3.3	What percentage of PLWD can see the inside of a dining room as soon as they leave their bedroom?	0	1	2	3
No.	Question	N/A	No	Yes	
4.2	Is the wardrobe (or cupboard) that the PLWD uses empty or full of a confusing number of clothes and/or irrelevant objects? (Only applicable to nursing homes that have a personal wardrobe for PLWD, wardrobes are not the same as a bedside lockers or cabinets.)		1	0	
9.3	Does the unit provide a room for palliative care that preserves the dignity, privacy and quality of life for the PLWD?		0	1	
No.	Question	25% or less	26% - 50%	51% - 75%	76% or more
5.3	What percentage of PLWD have a clearly defined path from their room to the dining room (e.g. by using colour, objects and signage, or can see the dining room from their room)?	0	1	2	3
5.10	What percentage of PLWD have a window that provides an attractive view to the outside from their bed?	0	1	2	3
5.6	Are personalised signs, symbols or displays easily seen to identify bedrooms?		0	1	
5.8	Is, or can, the bed be placed so that it possible to see the toilet from the bed when lying down?		0	1	
No.	Question	N/A	None	A Few	Many
7.4	Are there any pieces of furniture in the bedroom that are of a design that are not familiar to the majority of PLWD?	N/A	2	1	0
No.	Question	N/A	No	Yes	
7.2	Have most of the PLWD decorated their bedrooms (e.g. with photos, pictures, objects)?	0	1	2	
7.3	Do PLWD have their own furniture in their own bedrooms?	0	1	2	
No.	Question	N/A	No	Yes	
7.6	Are there bedrooms available for couples?		0	1	

Note:

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## 6. Bathroom & Toilets

**Mark only one box per row.**

No.	Question	N/A	No	Yes
3.6	Can a toilet be seen from the dining room that is used by most PLWD?	N/A	0	1
3.7	Can a toilet be seen from the living room that is used by most PLWD?	N/A	0	1
No.	Question	25% or less	26% - 75%	76% or more
5.9	Do the toilet seats contrast with the background?	0	1	2
No.	Question	N/A	No	Yes
5.7	Are shared ensuites/bathrooms/toilets clearly marked with a sign (text and symbol) or colour coded door?	N/A	0	1

Note:

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## 7. Design in response to vision for way of life

**Mark only one box per row.**

10.1. What is the vision/purpose of the unit for people with dementia? To provide: -

**Circle your option or options**

- a. A homelike environment
- b. A hotel like environment with hotel like services
- c. A medical care facility
- d. A lifestyle environment focusing on recreation, exercise or another aspect of lifestyle
- e. Be a centre of excellence for people with dementia
- f. An environment that focuses on person-centred care
- g. Other: \_\_\_\_\_

Circle one option\*

No.	Design in response to vision for way of life	1	2	3	4	5
10.2	How well does the built environment enable this to happen? (Ask the manager or their representative for their view)					

\*1 = not at all well, 5 = extremely well

Note:

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# **Posters and Webinars**

Sun, J., & Fleming, R., Fay, R., & Crookes., P. (2015). Defining and assessing the built characteristics of the built environment that contribute to the well-being of people with dementia living in Chinese, Malay and Indian aged care facilities in Singapore. Poster presented at the Wicking Dementia Interventions Symposium 2015, Hobart, Tasmania. doi: 10.13140/RG.2.2.17915.11047

Sun, J., & Fleming, R., Fay, R., & Crookes., P. (2016). Environmental Design of Nursing Homes for People with Dementia in Singapore. Paper presented at the Australian Association of Gerontology. Cutting Edge Ageing Research, Hobart, Tasmania. doi: 10.13140/RG.2.2.18334.54080

Sun, J., & Fleming, R., (2018). Knowledge Translation: a progress report on the culturally sensitive application of a dementia environment audit tool in Asia. Poster presented at the 3rd Tasmanian Dementia Symposium, Hobart, Tasmania. doi: 10.13140/RG.2.2.17915.11047

Sun, J., & Fleming, R., (2018). The built environment for people with dementia in Asia. Paper presented at the 51st Australian Association of Gerontology Conference, Melbourne, Victoria. doi: 10.13140/RG.2.2.21198.10563

Sun, J., & Fleming, R. (2019). Characteristics of the built environment for people with dementia in nursing homes in Asia. Poster presented at the Australian Dementia Forum 2019, Hobart, Tasmania. doi: 10.13140/RG.2.2.36466.56000

Sun, J. (2020). Adapting the Australian Environmental Assessment Tool – High Care (EAT-HC) [Webinar]. In Dementia Researcher: National Institute for Health Research, webinar series. Retrieved from <https://www.dementiaresearcher.nihr.ac.uk/event/adapting-the-australian-environmental-assessment-tool-high-care-eat-hc/>

# Contributors

**We would like to thank our community care partners for granting us permission to include photos of their facilities in this guide:**

Alzheimer's Disease Association  
Apex Harmony Lodge  
Care Corner  
Geylang East SCC (GEHA)  
Jamyiah Nursing Home  
Ling Kwang Home for Senior Citizens  
Lions Home for the Elders  
NTUC Health  
Ren Ci Nursing Home  
SASCO Senior Citizens' Home  
Society for the Aged Sick  
St Joseph's Home  
St Luke's ElderCare  
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# References

- Aged Care Standards and Accreditation Agency (2010). Statement of expectations and intent. Aged Care Standards and Accreditation Agency Ltd: Australia
- Alessi, C.A., Yoon, E.J., Schnelle, J.F., Al-Samarrai, N.R., Cruise, P.A. (1999). A randomized trial of a combined physical activity and environmental intervention in nursing home residents: do sleep and agitation improve? *Journal of the American Geriatrics Society*, 47, 784–791.
- Alzheimer's Australia (2004). Dementia Care and the Built Environment: Position Paper 3.
- Alzheimer Society of Canada (2011). Guidelines for Care: Person-centred care of people with dementia living in care homes. Framework. Alzheimer Society of Canada: Canada
- Andrews, J. (2013). A guide to creating a dementia-friendly ward. *Nursing Times*, 109(8), 20.
- Annerstedt, L. (1993). Development and consequences of group living in Sweden: a new mode of care for the demented elderly. *Social Science and Medicine*, 37, 1529–1538.
- Barnes, S. (2006). Space, choice and control, and quality of life in care settings for older people. *Environment and Behavior*, 38, 589–604.
- Bellelli, G., Frisoni, G.B., Bianchetti, A., Boffelli, S., Guerrini, G.B., Scotuzzi, A., Ranieri, P., Ritondale, G., Guglielmi, L., Fusari, A., Raggi, G., Gasparotti, A., Gheza, A., Nobili, G., & Trabucchi, M., (1998). Special care units for demented patients: a multicenter study. *The Gerontologist*, 38, 456–462.
- Bharathan, T. (2007). What do patterns of noise in a teaching hospital and nursing home suggest? *Noise and Health*, 9, 31.
- Bianchetti, A., Benvenuti, P., Ghisla, K. M., Frisoni, G. B. & Trabucchi, M. (1997). An Italian model of a dementia special care unit: results of a pilot study. *Alzheimer Disease and Associated Disorders*, 11, 53–56.
- Bowie, P. & Mountain, G. (1997). The relationship between patient behaviour and environmental quality for the dementing. *International Journal of Geriatric Psychiatry*, 12, 718–723.
- Brawley, E. C., (1997). Designing for Alzheimer's Disease: Strategies for Creating Better Care Environments. John Wiley & Sons
- Cairns, S., & Jacob, J.M. (2008). The Modern Touch: Interior Design and Modernisation in Post-Independence Singapore. *Environment and Planning A*, 40, 572-595.
- Cantley, C. & Wilson R.C., (2002). 'Put yourself in my place': Designing and managing care homes for people with dementia. Bristol: UK
- Chappell, N. L. & Reid, C. R. (2000). Dimensions of care of dementia sufferers in long-term care institutions: are they related to outcomes? *Journals of Gerontology*, 55B, S234–244.
- Cleary, T. A., Clamon, C., Price, M. & Shullaw, G. (1988). A reduced stimulation unit: effects on patients with Alzheimer's disease and related disorders. *The Gerontologist*, 28, 511–514.
- Cohen, U. & Weisman, G. D. (1991). Holding on to Home: Designing Environments for People with Dementia. Baltimore: Johns Hopkins University Press.
- Coles, R., Duncan, I., Kelly, M. & Wightman, A. (1992) Signposts not barriers, Stirling: Dementia Services Development Centre.
- Comas-Herrera, A., Wittenberg, R., Pickard, L & Knapp, M (2007). 'Cognitive impairment in older people: future demand for long-term care services and the associated costs.' *International Journal of Geriatric Psychiatry*, 22(10), 1037-45.
- Commission for Social Care Inspection (2006). Time to care: An overview of home care services for older people in England. London: CSCI
- Community Care Facilities Licensing Branch (2001). A Guide to choosing a Licensed Residential Care Facility or Residential Care Home. National Library of Canada Cataloguing in Publication Data: BC
- Cox, H., Burns, I. & Savage, S. (2004). Multisensory environments for leisure: promoting well-being in nursing home residents with dementia. *Journal of Gerontological Nursing*, 30, 37–45.
- Cutler, L.J., Kane R.A, Degenholtz, H.B., Miller, M.J. & Grant L., (2006). Assessing and comparing physical environments for nursing home residents: Using new tools for greater research specificity. *The Gerontologist*, 46(1):42-51.
- Day, K., Carreon, D. & Stump, C. (2000). The therapeutic design of environments for people with dementia: a review of the empirical research. *The Gerontologist*, 40(4), 397–416.
- Dementia Services Development Centre (2012) Virtual Care Home. Stirling: Scotland (2012). Retrieved from <http://dementia.stir.ac.uk/design/virtual-environments/virtual-care-home>
- Department of Communications, Information Technology and the Arts (2005). Building Quality for Residential Care Services: Certification. Australian Government Department of Health and Ageing: Canberra
- Department of Health (2001). National Service Framework for Older People. Department of Health: UK
- Dickinson, J. I. & McLain-Kark, J. (1998). Wandering behavior and attempted exits among residents diagnosed with dementia-related illnesses: a qualitative approach. *Journal of Women and Aging*, 10, 23–34.
- Dickinson, J. I., McLain-Kark, J. & Marshall-Baker, A. (1995). The effects of visual barriers on exiting behavior in a dementia care unit. *The Gerontologist*, 35(1), 127–130.
- Elmstahl, S., Annerstedt, L. & Ahlund, O. (1997). How should a group living unit for demented elderly be designed to decrease psychiatric symptoms? *Alzheimer Disease and Associated Disorders*, 11, 47–52.
- Eriksson S. (2010). Developments in dementia strategy. *International Journal of Geriatric Psychiatry*, 25 (9): 885–886.
- Evans, B. (1989). Managing from Day to Day: Creating a Safe and Workable Environment. Minneapolis: Department of Veterans Affairs Medical Centre.
- Fleming, R. & Purandare, N. (2010). Long-term care for people with dementia: environmental design guidelines. *International Psychogeriatrics*, 22 (7), 1084-1096.
- Fleming, R. (2010). The use of environmental assessment tools for the evaluation of Australian residential facilities for people with dementia. HammondCare: NSW
- Fleming, R., Crookes, P. & Sum, S. (2008). A Review of the Empirical Literature on the Design of Physical Environments for People with Dementia. NSW: Primary Dementia Collaborative Research Centre, UNSW.
- Forbes, D., Morgan, D., Bangma, J., Peacock, S. & Adamson, J. (2004). Light therapy for managing sleep, behaviour, and mood disturbances in dementia. *Cochrane Databases of Systematic Review*, 2, CD003946.

- Garwood, S. (2011). Extra Care Housing and Dementia Commissioning Checklist. Department of Health National Dementia Strategy Implementation Group: UK
- Grant, L. A., Kane, R. A. & Stark, A. J. (1995). Beyond labels: nursing home care for Alzheimer's disease in and out of special care units. *Journal of the American Geriatrics Society*, 43, 569–576.
- Hall, G., Kirschling, M. V. & Todd, S. (1986). Sheltered freedom: an Alzheimer's unit in an ICF. *Geriatric Nursing*, 7, 132–137.
- Hanley, I. G. (1981). The use of signposts and active training to modify ward disorientation in elderly patients. *Journal of Behavior Therapy and Experimental Psychiatry*, 12, 241–247.
- Hewawasam, L. C. (1996). The use of two-dimensional grid patterns to limit hazardous ambulation in elderly patients with Alzheimer's disease. *Nursing Times Research*, 1, 217–227.
- Ikegami, N., Yamauchi, K., & Yamada, Y. (2003). The long term care insurance law in Japan: impact on institutional care facilities. *International Journal of Geriatric Psychiatry*, 18(3):217-21.
- Keating, M., Long, J., & Wright, J. (2012). Leading culture change to improve dementia care. *Nursing Times*, 109(8), 16-8.
- Knapp, M., Comas-Herrera, A., Soman, A., & Banerjee, B. (2007). Dementia: Summary report for the National Audit Office international comparisons. Personal Social Services Research Unit, London School of Economics and Political Science and the Institute of Psychiatry, King's College: London
- Kong, L., & Yeoh, B. S. (1994). Urban conservation in Singapore: A survey of state policies and popular attitudes. *Urban Studies*, 31(2), 247-265.
- Lai, A. E. (1995). Meanings of multiethnicity: A case study of ethnicity and ethnic relations in Singapore. Oxford University Press, USA.
- Lawton, M.P., Weisman, G.D., Sloane, P., Norris-Baker, C., Calkins, M., & Zimmerman, S. I. (2000). Professional Environmental Assessment Procedure for Special Care Units for elders with dementing illness and its relationship to the Therapeutic Environment Screening Schedule. *Alzheimer Disease and Associated Disorders*, 14(1), 28-38.
- Leed (2009). Minimum Programmer Requirement. US. Green Building Council: Washington
- Leon, J. & Ory, M. G. (1999). Effectiveness of Special Care Unit (SCU) placements in reducing physically aggressive behaviors in recently admitted dementia nursing home residents. *American Journal of Alzheimer's Disease and Other Dementias*, 14(5), 270–277.
- Lin, C. (2010). The development of quality indicators for Taiwanese institutional dementia care. Retrieved May 20, 2012 from <https://dspace.stir.ac.uk/bitstream/1893/2542/1/PhD%20Thesis%20of%20CheYing%20Lin.pdf>
- Low, L. F., Draper, B. & Brodaty, H. (2004). The relationship between self-destructive behaviour and nursing home environment. *Aging and Mental Health*, 8(1), 29–33.
- Marshall, M., (2001). Environment: how it helps to see dementia as a disability in Care Homes and Dementia (ed S. Benson) The Journal of Dementia Care
- Marshall, M., et al (2002). Tools for the Future: How Dementia friendly is your building. Dementia Services Development Centre
- Minister for Health and Social Services of the Welsh Assembly Government (2004). National Minimum Standard for Older People: A statement of national minimum standards applicable to care homes for older people made by the Minister for Health and Social Services of the Welsh Assembly Government under the powers conferred by section 23(1) of the Care Standards Act 2000.
- Namazi, K. H. & Johnson, B. D. (1991). Physical environmental cues to reduce the problems of incontinence in Alzheimer's disease units. *American Journal of Alzheimer's Disease and Other Dementias*, 6(6), 22–28.
- Namazi, K. H. & Johnson, B. D. (1992). Pertinent autonomy for residents with dementias: modification of the physical environment to enhance independence. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 16–21.
- Namazi, K. H. & Johnson, B. D. (1992). Dressing independently: a closet modification model for Alzheimer's disease patients. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 22–28.
- Namazi, K. H. & Johnson, B. D. (1992). How familiar tasks can enhance concentration in Alzheimer's disease patients. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 35–40.
- Namazi, K. H. & Johnson, B. D. (1992). The effects of environmental barriers on the attention span of Alzheimer's disease patients. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 9–15.
- Namazi, K. H. & Johnson, B. D. (1992). Environmental issues related to visibility and consumption of food in an Alzheimer's disease unit. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 30–34.
- Namazi, K. H., Eckert, J. K., Kahana, E., & Lyon, S. M. (1989). Psychological well-being of elderly board and care home residents. *The Gerontologist*, 29(4), 511–516.
- Namazi, K. H., Rosner, T. T., & Rechlin, L. (1991). Long-term memory cuing to reduce visuo-spatial disorientation in Alzheimer's disease patients in a special care unit. *American Journal of Alzheimer's Disease and Other Dementias*, 6(6), 10–15.
- National Audit Office (2007). Improving Services and support for people with dementia. London: TSO.
- National Collaborating Centre for Mental Health (UK). Dementia: A NICE-SCIE Guideline on Supporting People With Dementia and Their Carers in Health and Social Care. Leicester (UK): British Psychological Society; 2007. (NICE Clinical Guidelines, No. 42.) 7, THERAPEUTIC INTERVENTIONS FOR PEOPLE WITH DEMENTIA – COGNITIVE SYMPTOMS AND MAINTENANCE OF FUNCTIONING. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK55462/>
- Norris-Baker C, Weisman G et al. (1999). Assessing special care units for dementia: The Professional Environmental Assessment Protocol. Enabling environments: Measuring the impact of environment on disability and rehabilitation. Steinfeld E and Danford GS (eds). New York: Kluwer Academic/Plenum; 1999.
- Passini, R., Pigot, H., Rainville, C. & Tetreault, M. H. (2000). Wayfinding in a nursing home for advanced dementia of the Alzheimer's type. *Environment and Behavior*, 32, 684–710.
- Porteus, J. [ed.] (2012). At a glance: a checklist for developing dementia friendly communities. London: Housing Learning and Improvement Network (Housing LIN), June 2012.
- Pugh, C. (1987). Housing in Singapore: the effective ways of the unorthodox. *Environment and Behaviour*, 19(3), 311-330.
- Reimer, M. A., Slaughter, S., Donaldson, C., Currie, G., & Eliasew, M. (2004). Special care facility compared with traditional environments for dementia care: a longitudinal study of quality of life. *Journal of the American Geriatrics Society*, 52(7), 1085–1092.
- Rosewarne, R., Opie, J., Bruce, A., Ward, S., & Doyle, C. (1997). Care Needs of People with Dementia and Challenging Behaviour Living in Residential Facilities. Canberra: Australian Government Publishing Service.
- Rothera, I., Jones, R., Harwood, R., Avery, A. J., Fisher, K., James, V., & Waite, J. (2008). An evaluation of a specialist multiagency home support service for older people with dementia using qualitative methods. *International Journal of Geriatric Psychiatry*, 23(1), 65-72.

- Satlin, A., Volicer, L., Ross, V., Herz, L. & Campbell, S. (1992). Bright light treatment of behavioural and sleep disturbances in patients with Alzheimer's disease. *American Journal of Psychiatry*, 149, 1028-1032.
- Skladzien, E., Bowditch, K., & Rees, G. (2011). National Strategies to Address Dementia: A report by Alzheimer's Australia. Australia.
- Sloane P.D. & Mathew L.J. (1990). The Therapeutic Environment Screening Scale. *American Journal of Alzheimer's Care and Related Disorders and Research* 1990; 5(6):22-26.
- Sloane P.D., Mitchell, C.M., Weisman, G., Zimmerman, S., Foley, K.M., Lynn, M., Calkins, M., Lawton, M.P., Teresi, J., Grant, L., Lindeman, D. & Montgomery, R. (2002). The Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH): An observational instrument for assessing the physical environment of institutional settings for persons with dementia. *Journals of Gerontology Series B-Psychological Sciences & Social Sciences*, 57(2), S69-S78.
- Sloane, P. D., Williams, C. S., Mitchell, C. M., Preisser, J. S., Wood, W., Barrick, A. L., & Zimmerman, S. (2007). High-intensity Environmental Light in Dementia: Effect on Sleep and Activity. *Journal of the American Geriatrics Society*, 55(10), 1524-1533.
- Sloane, P. D., Mitchell, C. M., Preisser, J. S., Phillips, C., Commander, C. & Burker, E. (1998). Environmental correlates of resident agitation in Alzheimer's disease special care units. *Journal of the American Geriatrics Society*, 46, 862-869.
- Tan, K. J., Loh, C. T., Tan, S. A., Lau, W. C., & Kwok, K. (1985). Physical planning and design. Housing a nation: 25 years of public housing in Singapore, Eds A, 56-112.
- Te Boekhorst, S., Depla, M., de Lange, J., Pot, A. M. & Eefsting, J. A. (2009). The effects of group living homes on older people with dementia: a comparison with traditional nursing home care. *International Journal of Geriatric Psychiatry*, 24(9), 970-978.
- The Government of Hong Kong Special Administrative Region (2012). Procedure Guide for Application for Licensing of a Proposed Residential Care Home for the Elderly. Social Welfare Department Retrieved June 10, 2012, [http://www.swd.gov.hk/en/index/site\\_pubsvc/page\\_elderly/sub\\_residentia/id\\_licensing/](http://www.swd.gov.hk/en/index/site_pubsvc/page_elderly/sub_residentia/id_licensing/)
- The Guardian (2012). Care homes must become dementia-friendly places. Retrieved June 10, 2012 <http://www.guardian.co.uk/social-care-network/2012/may/23/dementia-friendly-carehomes1+B38>
- The Joint Commission (2012). Long Term Care Accreditation Requirements. Joint Commission accreditation requirements fall into two major categories: Standards and National Patient Safety Goals. Retrieved May 23, 2012 from [http://www.jointcommission.org/accreditation/long\\_term\\_care\\_accreditation\\_requirements.aspx](http://www.jointcommission.org/accreditation/long_term_care_accreditation_requirements.aspx)
- Thorpe, L., Middleton, J., Russell, G. & Stewart, N. (2000). Bright light therapy for demented nursing home patients with behavioral disturbance. *American Journal of Alzheimer's Disease and Other Dementias*, 15, 18-26.
- Thompson, R., & Schofield, B. (2013). Insomnia: how can I promote an environment that supports sleep for people with dementia? *Nursing Older People*, 25(2):12.
- Torrington, J. (2006). What has architecture got to do with dementia care? Explorations of the relationship between quality of life and building design in two EQUAL projects. *Quality in Ageing*, 7, 34-49.
- United States, Office of Technology Assessment, Congress (1992). Special care units for people with Alzheimer's and other dementias : consumer education, research, regulatory, and reimbursement issues. DIANE Publishing: USA
- U.S. Green Building Council (2011). LEED for Healthcare. Retrieved May 23, 2012 from <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1765>
- Van Gennip, E. M., & Smitt, P. A. (2000). The Netherlands Institute for Accreditation of Hospitals. *International Journal Quality Health Care*. 12(3), 259-62.
- Verbeek, H., van Rossum, E., Zwakhalen, S. M. G., Kempen, G. I. J. M. & Hamers, J. P. H. (2009). Small, homelike care environments for older people with dementia: a literature review. *International Psychogeriatrics*, 21, 252-264.
- Wang, C. H., & Kuo, N. W. (2006). Zeitgeists and development trends in long-term care facility design. *Journal of Nursing Research*, 14, 123-132.
- Wells, Y., & Jorm, A. F. (1987). Evaluation of a special nursing home unit for dementia sufferers: a randomised controlled comparison with community care. *Australian and New Zealand Journal of Psychiatry*, 21, 524-531.
- Wiener, J.M., Tilly, J., Howe, A., Doyle, C., Cuellar, A.E., Campbell, J. & Ikegami, N. (2007). Quality assurance for long-term care: The experiences of England, Australia, Germany and Japan. Washington, D.C.: AARP Public Policy Institute. Retrieved 39147 from [http://www.aarp.org/resea\\_rch/longtermcare/quality/2007\\_05\\_ltc.html](http://www.aarp.org/resea_rch/longtermcare/quality/2007_05_ltc.html)
- World Health Organization (2012). Global age-friendly cities project 2007. Retrieved May 18, 2012, from [www.who.int/ageing/age\\_friendly\\_cities\\_network](http://www.who.int/ageing/age_friendly_cities_network).
- World Health Organization (2012). Dementia: a public health priority. Retrieved May 18, 2012 from [http://www.who.int/about/licensing/copyright\\_form/en/index.html](http://www.who.int/about/licensing/copyright_form/en/index.html).
- Zeisel, J., & Raia, P. (2000) Nonpharmacological treatment for Alzheimer's disease: A mind brain approach. *American Journal of Alzheimer's Disease and Other Dementias*, 15(6), 331-340.
- Zeisel, J., Silverstein, N. M., Hyde, J., Levkoff, S., Lawton, M. P., & Holmes. W. (2003). Environmental correlates to behavioral health outcomes in Alzheimer's special care units. *The Gerontologist*, 43(5), 697-711.
- Zuidema, S. U., de Jonghe, J. F., Verhey, F. R., & Koopmans, R. T. (2010). Environmental correlates of neuropsychiatric symptoms in nursing home patients with dementia. *International journal of geriatric psychiatry*, 25(1), 14-22.





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