Dementia Enabling Design: a quick overview

including some hot tips for aged care and domestic settings

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Heritage & Age Friendly Design

What to expect today

What are dementia design principles?

- Design guides and assessment tools explained
- 2 key resources to refer to

Why is the environment so important to people with dementia?

- Environmental press theory
- The brain and the environment
- Vision loss
- Hearing loss

Dementia design principles applied:
a few tools for retrofitting

- Tonal contrast
- Colour and pattern
- Clear signage
- Glazed cupboards and open shelving

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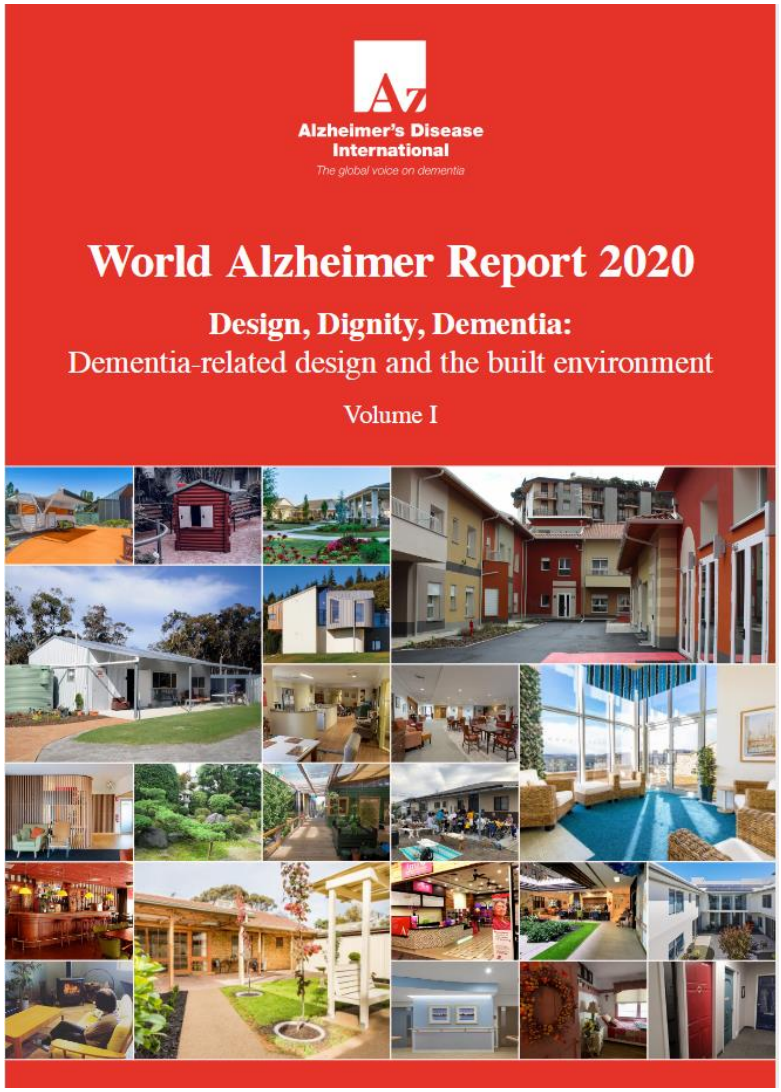
What are dementia design principles?

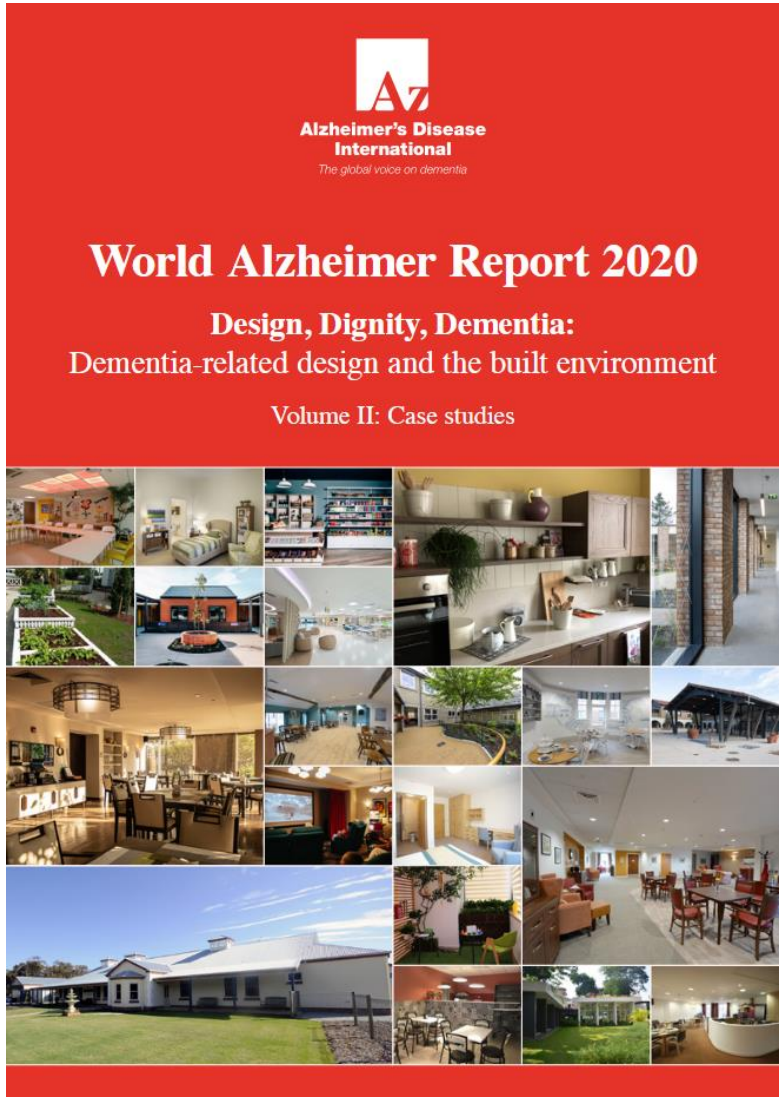
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Dementia design principles

Discussion of designing for people living with dementia may be facilitated by a shared understanding of the role of principles, design approaches and design details, in linking the overarching goal of affording dignity to people with dementia to the construction of enabling buildings.

Fleming, R., Zeisel, J., & Bennett, K. A. (2020). *World Alzheimer Report 2020: Design Dignity Dementia: Dementia-related design and the built environment, Volume 1*. Alzheimer's Disease International.





Fleming, Richard, John Zeisel, and Kirsty A Bennett. "World Alzheimer Report 2020 : Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 1." London, England: Alzheimer's Disease International, 2020.

Fleming, Richard, John Zeisel, and Kirsty A Bennett. "World Alzheimer Report 2020 : Design Dignity Dementia: Dementia-Related Design and the Built Environment, Volume 2: Case Studies." London, England: Alzheimer's Disease International, 2020.

Design Guides & Assessment tools



Design guides provide overarching principles and recommendations for creating dementia-friendly environments.

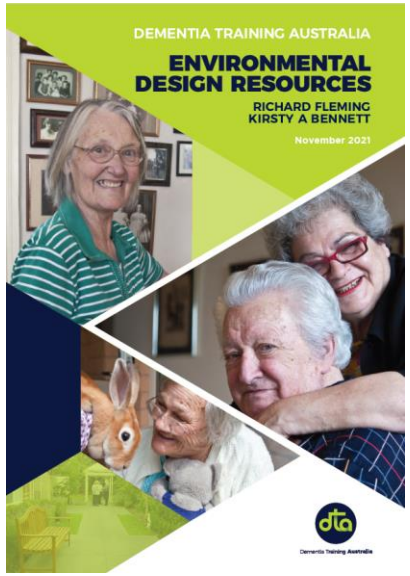


Environment assessment tools offer a structured approach to evaluating existing environments and identifying areas for improvement.



Together, they support the design, assessment, and ongoing improvement of environments that promote the well-being and quality of life of individuals living with dementia.

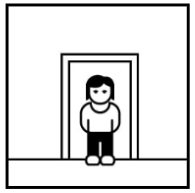
Fleming & Bennett's 10 Design principles





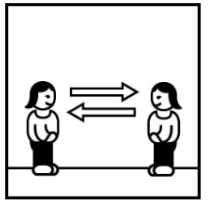
1. Unobtrusively reduce risks.

People with dementia require an internal and external environment that is safe and easy to move around if they are to continue to pursue their way of life and make the most of their abilities. Potential risks such as steps must be removed. All safety features must be unobtrusive as obvious safety features, such as fences or locked doors, can lead to frustration, agitation and anger or apathy and depression.



2. Provide a human scale.

The scale of a building can affect the behaviour and feelings of a person with dementia. The experience of scale is influenced by three key factors; the number of people that the person encounters, the overall size of the building and the size of the individual components (such as doors, rooms and corridors). A person should not be intimidated by the size of the surroundings or confronted with a multitude of interactions and choices. Rather the scale should encourage a sense of wellbeing and enhance the competence of a person.



3. Allow people to see and be seen.

The provision of an easily understood environment will help to minimise confusion. It is particularly important for people with dementia to be able to recognise where they are, where they have come from and where they can go. When a person can see key places, such as a lounge room, dining room, their bedroom, kitchen and an outdoor area they are more able to make choices and see where they want to go. Buildings that provide these opportunities are said to have good visual access. Good visual access opens up opportunities for engagement and gives the person with dementia the confidence to explore their environment. It can also enable staff to see residents. This reduces staff anxiety about the residents' welfare and reassures the residents.



4. Manage levels of stimulation – reduce unhelpful stimulation.

Because dementia reduces the ability to filter stimulation and attend to only those things that are important, a person with dementia becomes stressed by prolonged exposure to large amounts of stimulation. The environment should be designed to minimise exposure to stimuli that are not specifically helpful to the resident, such as unnecessary or competing noises and the sight of signs, posters, places and clutter that are of no use to the resident. The full range of senses must be considered. Too much visual stimulation is as stressful as too much auditory stimulation.



5. Manage levels of stimulation – optimise stimulation.

Enabling the person with dementia to see, hear and smell things that give them cues about where they are and what they can do, can help to minimise their confusion and uncertainty. Consideration needs to be given to providing redundant cueing i.e. providing a number of cues to the same thing, recognising that what is meaningful to one person will not necessarily be meaningful to another. Using text and image in signs is a simple way to do this. Encouraging a person to recognise their bedroom through the presence of furniture, the colour of the walls, the design of a light fitting and/or the bedspread is a more complex one. Cues need to be carefully designed so that they do not add to clutter and become over stimulating.



6. Support movement and engagement.

Purposeful movement can increase engagement and maintain a person's health and wellbeing. It is encouraged by providing a well defined pathway, free of obstacles and complex decision points, that guides people past points of interest and opportunities to engage in activities or social interaction. The pathway should be both internal and external, providing an opportunity and reason to go outside when the weather permits.

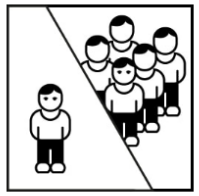
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Fleming & Bennett's 10 Design principles



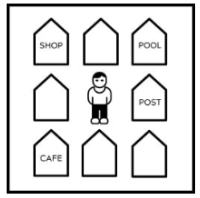
7. Create a familiar place.

A person with dementia is more able to use and enjoy places and objects that are familiar to them from their early life. The environment should afford them the opportunity to maintain their competence through the use of familiar building design (internal and external), furniture, fittings and colours. The personal backgrounds of the residents need to be reflected in the environment. The involvement of the person with dementia in personalising the environment with their familiar objects should be encouraged.



8. Provide a variety of places to be alone or with others – in the unit.

People with dementia need to be able to choose to be on their own or spend time with others. This requires the provision of a variety of places in the unit, some for quiet conversation and some for larger groups, as well as places where people can be by themselves. These internal and external places should have a variety of characters, e.g. a place for reading, looking out of the window or talking, to cue the person to engage in relevant activity and stimulate different emotional responses.



9. Provide a variety of places to be alone or with others – in the community.

Without constant reminders of who they are, a person with dementia will lose their sense of identity. Frequent interaction with friends and relatives can help to maintain that identity and visitors should be able to drop in easily and enjoy being in places that encourage interaction.

Stigma remains a problem for people with dementia so the unit should be designed to blend with the existing community and not stand out as a 'special' unit. Where possible a 'bridge' should be built between the unit and the community by providing a place that is shared by the community and people with dementia. A coffee shop near the unit, for example, may enable a person with dementia to go there easily without needing assistance. Where the unit is a part of a larger site, there should be easy access around the site so people with dementia, their families and friends can interact with other people who live there.

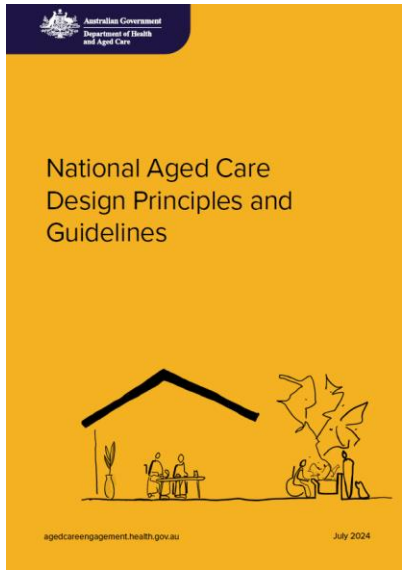


10. Design in response to vision for way of life.

The choice of life style, or philosophy of care, will vary between facilities. Some will choose to focus on engagement with the ordinary activities of daily living and have fully functioning kitchens. Others will focus on the ideas of full service and recreation, while still others will emphasise a healthy life style or, perhaps, spiritual reflection. The way of life offered needs to be clearly stated and the building designed both to support it and to make it evident to the residents and staff. The building should be the embodiment of the philosophy of care, constantly reminding the staff of the values and practices that are required while providing them with the tools they need to do their job.

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New Australian guidelines & principles



Principle 1 Enable the Person



1.1 Minimal Clutter



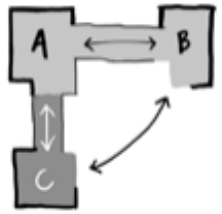
1.2 Acoustic Comfort



1.3 Better Lighting



1.4 Tonal Contrast



1.5 Simple Circulation



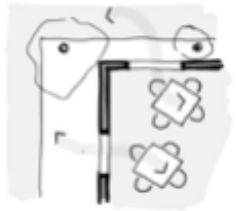
1.6 Safe Floors



1.7 Supportive Seating



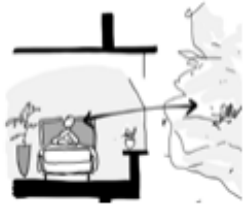
1.8 Stress-free Toilets



1.9 Clean Air



1.10 Comfortable Temperatures



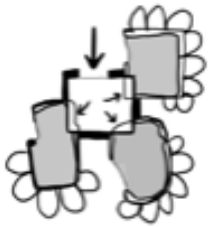
1.11 Nature Indoors

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Principle 2 Cultivate a Home



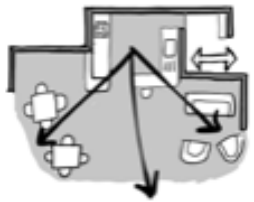
2.1 Personalised Home



2.2 Small Households



2.3 Private Entries



2.4 Domestic Kitchens



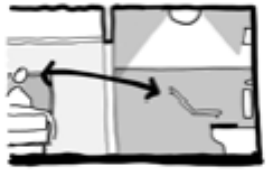
2.5 Room Clusters



2.6 Enabling Corridors



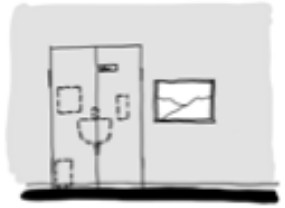
2.7 Private Bedrooms



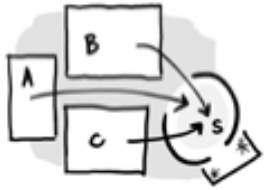
2.8 Ensuite Bathrooms



2.9 Appropriate Furniture



2.10 Clinical Support



2.11 Private Staffroom

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Principle 3 Access the Outdoors



3.1 Dedicated Outdoors



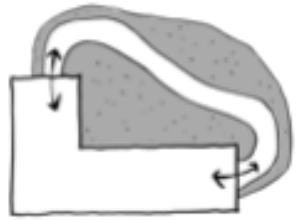
3.2 Garden Connections



3.3 Garden Verandahs



3.4 Garden Destinations

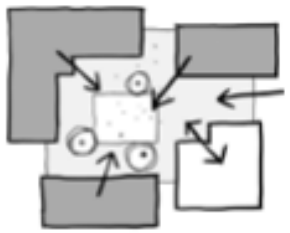


3.5 Clear Paths

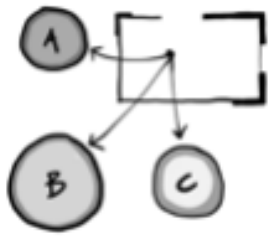
Principle 4 Connect with Community



4.1 Neighbourhood Access



4.2 Community Hub



4.3 Easy Navigation to Households



4.4 Integrated Building Form

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A comparison

Designing for Dignity: A Comparison of Two Key Australian Aged Care Design Resources

I've recently compared two significant documents in aged care design:

- The Environmental Assessment Tool - Higher Care (EAT-HC) Handbook
-
- The National Aged Care Design Principles and Guidelines

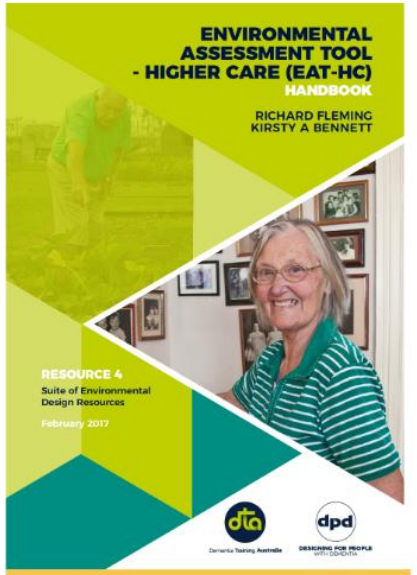
Key Takeaways:

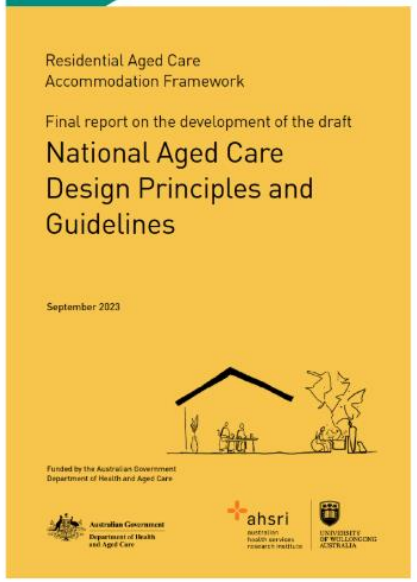
- Both emphasize creating homelike environments with small household models
- EAT-HC provides a detailed assessment tool, while the National Guidelines offer a checklist,
- The National Guidelines incorporate recent learnings, including COVID-19 considerations
- Both stress the importance of personalization, safety, and connection to nature
- The National Guidelines place more emphasis on community integration and sustainability

Interestingly, the EAT-HC includes practical assessment and planning tools not found in the National Guidelines. These can be used to develop staff capability, whilst improving the environment.

Is there a place for both these resources in the architects tool box?

#AgedCare #DesignForDementia #HealthcareDesign





Why is the environment so important for people with dementia?

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Nawton's Environmental Press Theory

Core Concept: Examines the relationship between individuals (especially older adults) and their environment

Key Elements:

ENVIRONMENTAL PRESS
The demands and challenges posed by the environment

PERSONAL COMPETENCE
An individual's capabilities (physical, cognitive, psychological)

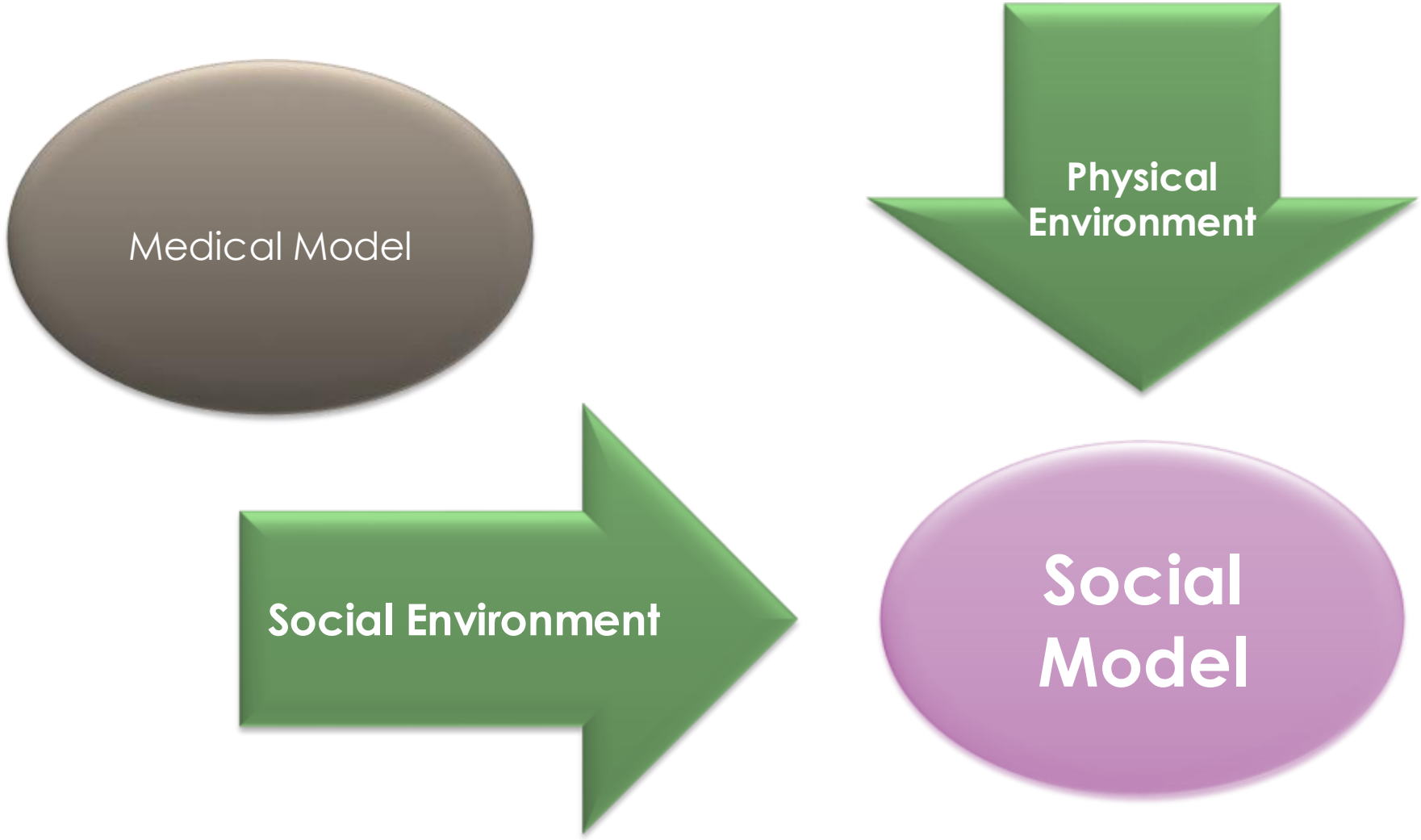
ADAPTATION ZONE
Where press and competence are balanced, leading to optimal functioning



Key Insight: Well-being occurs when environmental demands appropriately match individual capabilities

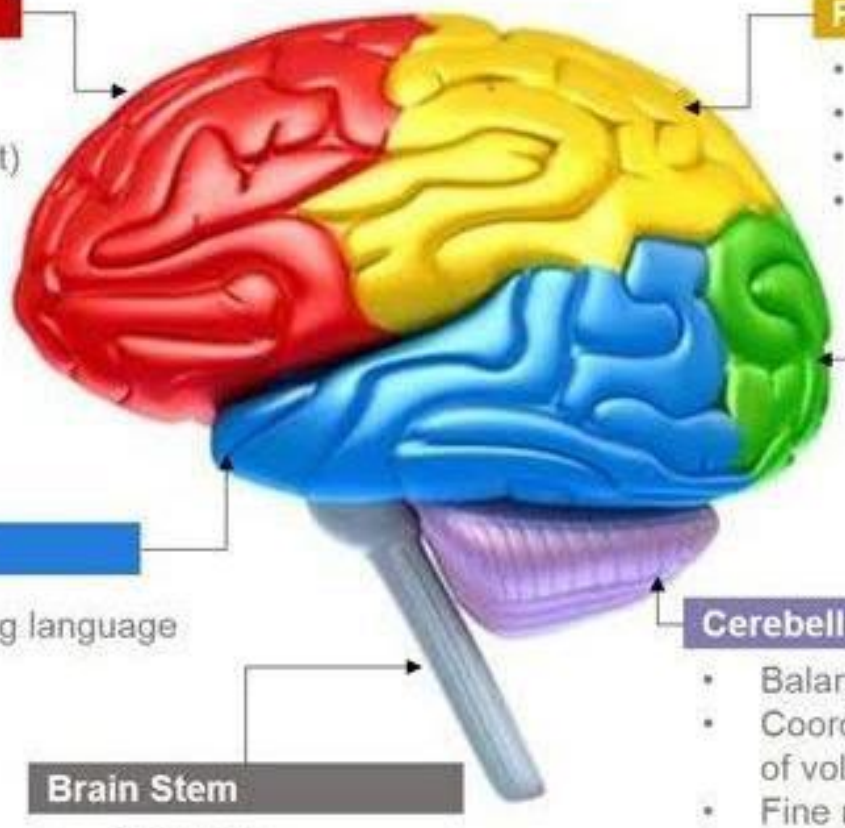
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The social model of care



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The brain and the environment



Frontal Lobe
- Problem solving
- Emotional traits
- Reasoning (judgment)
- Speaking
- Voluntary motor activity

Parietal Lobe
- Knowing right from left
- Sensation
- Reading
- Body orientation

Occipital Lobe
- Vision
- Color perception

Temporal Lobe
- Understanding language
- Behavior
- Memory
- Hearing

Cerebellum
- Balance
- Coordination and control of voluntary movement
- Fine muscle control

Brain Stem
- Breathing
- Body temperature
- Digestion
- Alertness/sleep
- Swallowing

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Ageing Sight



- by 60 years, the pupils may decrease to about one third of the size from 20 years
- reduced speed of adapting to change in light level
- increased sensitivity to glare
- the eye muscles become less able to fully rotate the eye
- reduced peripheral vision/side vision
- reduced visual acuity/sharpness of vision
- reduced depth perception
- reduced sensitivity to contrasts

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Sight conditions

Macular Degeneration



Visual field loss



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Normal vision



Glaucoma



Diabetic retinopathy



Cataracts

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Yellowing of the lens

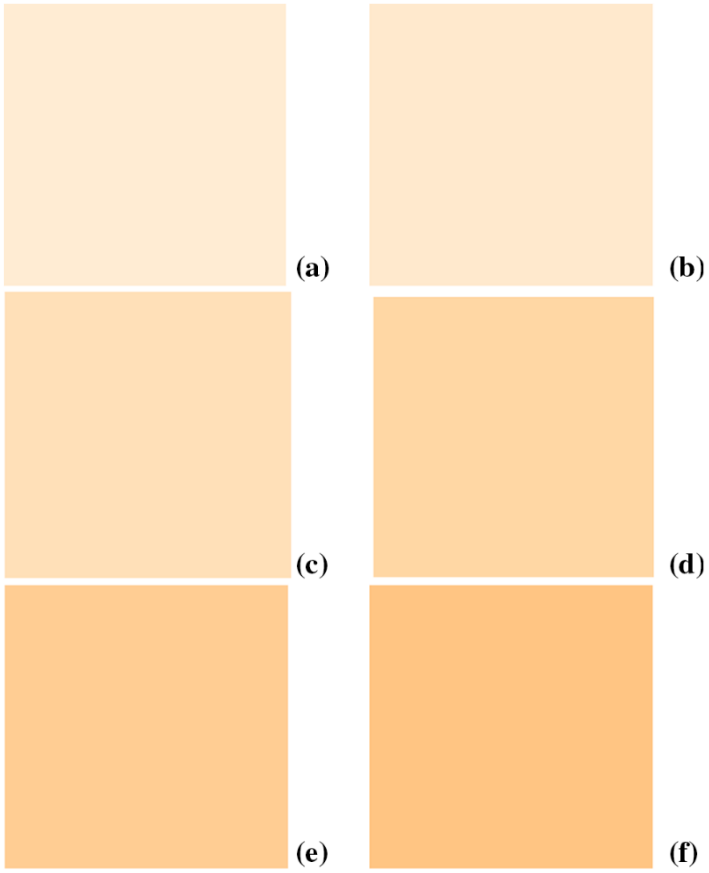


Fig. 4 The simulated uniform yellowing pigmentation for age, **a** 55 years old; **b** 60 years old; **c** 65 years old; **d** 70 years old; **e** 75 years old; **f** 80 years old



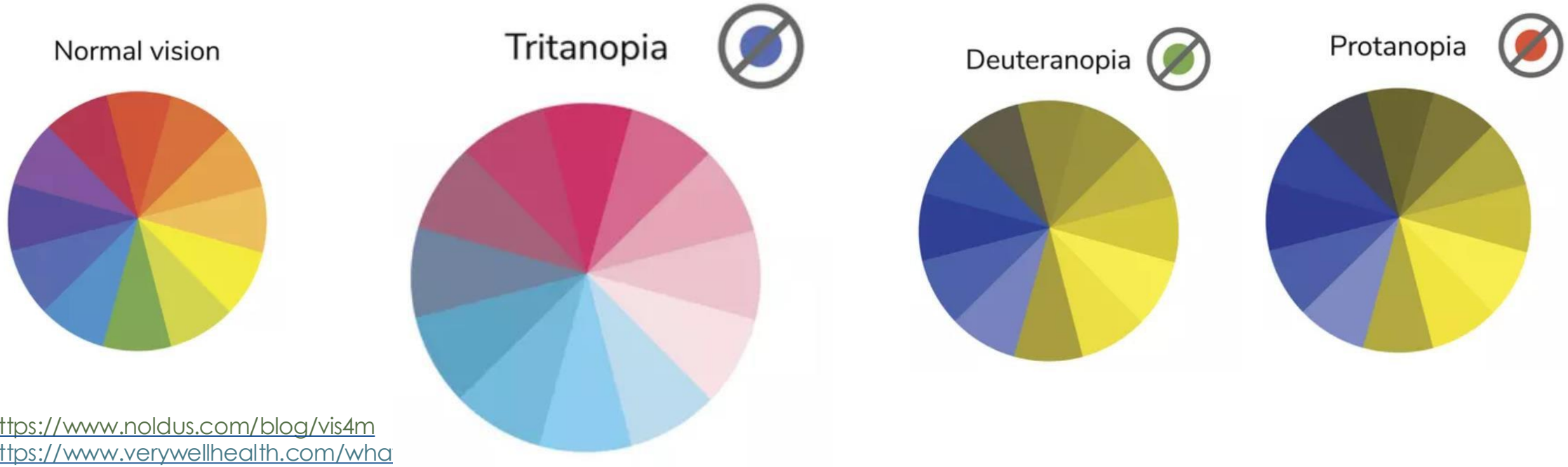
Hassan, M. F., Paramesran, R., Tanaka, Y., & Tanaka, K. (2018). A method using uniform yellowing pigmentation to model the color perception of the elderly people. *Signal, Image and Video Processing*, *12*(6), 1019–1026. https://doi.org/10.1007/s11760-018-1247-3

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Colour blindness

Alzheimer's patients can experience significantly impaired color and also contrast sensitivity. This gives a visual impairment which is rather like tritan color-blindness (tritanomaly).

This blue color discrimination impairment has also been reported for other diseases including: multiple sclerosis, Parkinson's disease, Huntington's disease, and Gilles de la Tourette syndrome, so its relevance is wider than just Alzheimer's.



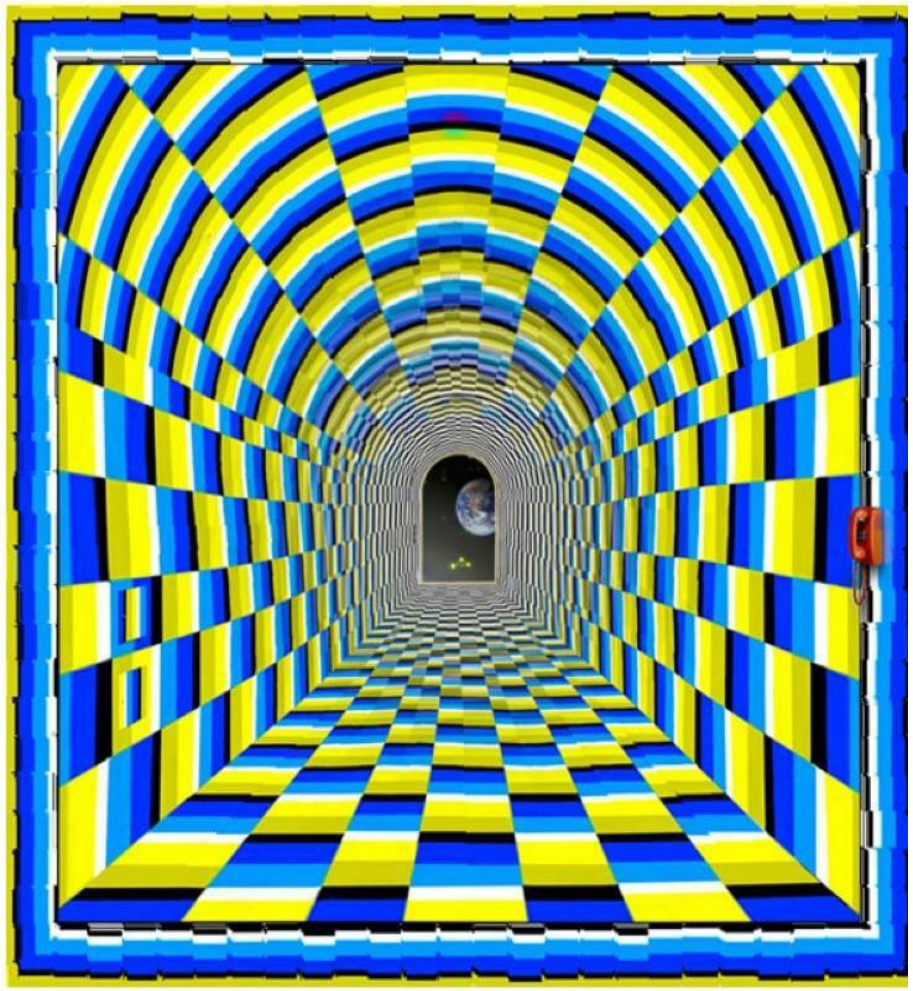
https://www.noldus.com/blog/vis4m
https://www.verywellhealth.com/whasee-5092522

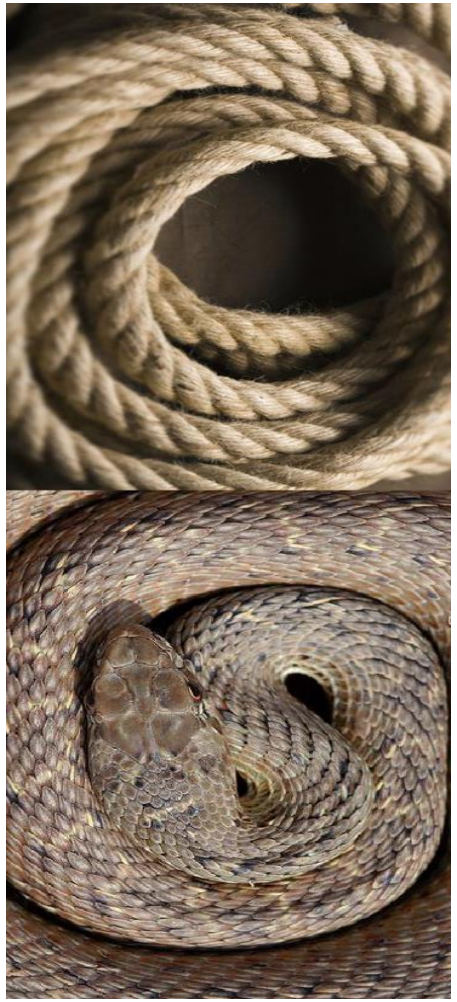
Kim, H. J., Ryou, J. H., Choi, K. T., Kim, S. M., Kim, J. T., & Han, D. H. (2022). Deficits in color detection in patients with Alzheimer disease. *PLoS ONE*, *17*(1). https://doi.org/10.1371/journal.pone.0262226

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Visual perceptions

illusions
misinterpretations
hallucinations

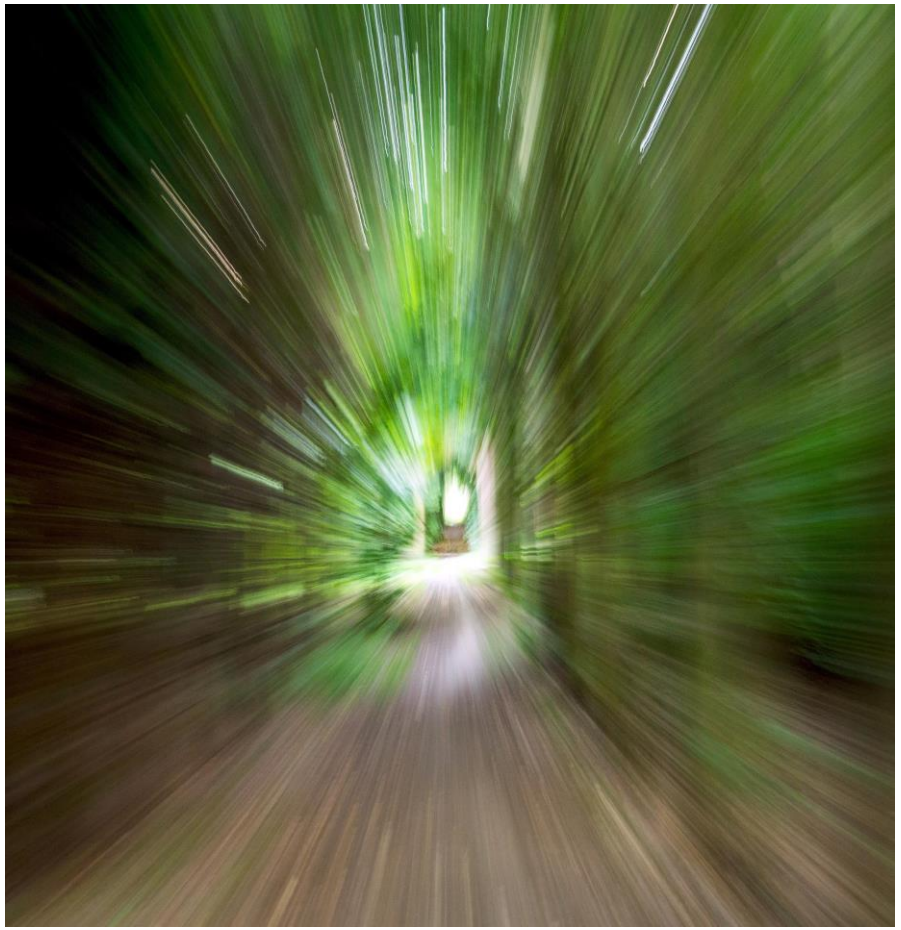




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Individuals living with dementia may have difficulties in:

- Reduced visual acuity
- Reduction in peripheral visual field
- Changed colour perception
- Blurring
- Decreased contrast sensitivity
- Decreased depth perception
- Difficulty re-adjusting one's spatial orientation
- Difficulty judging height of the floor / high stepping
- Inability of finding an item, even if directly in their peripheral field
- Difficulty positioning oneself on a seat
- Difficulty problem solving visual illusions
- Perceiving glare as water on the floor



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Hearing loss

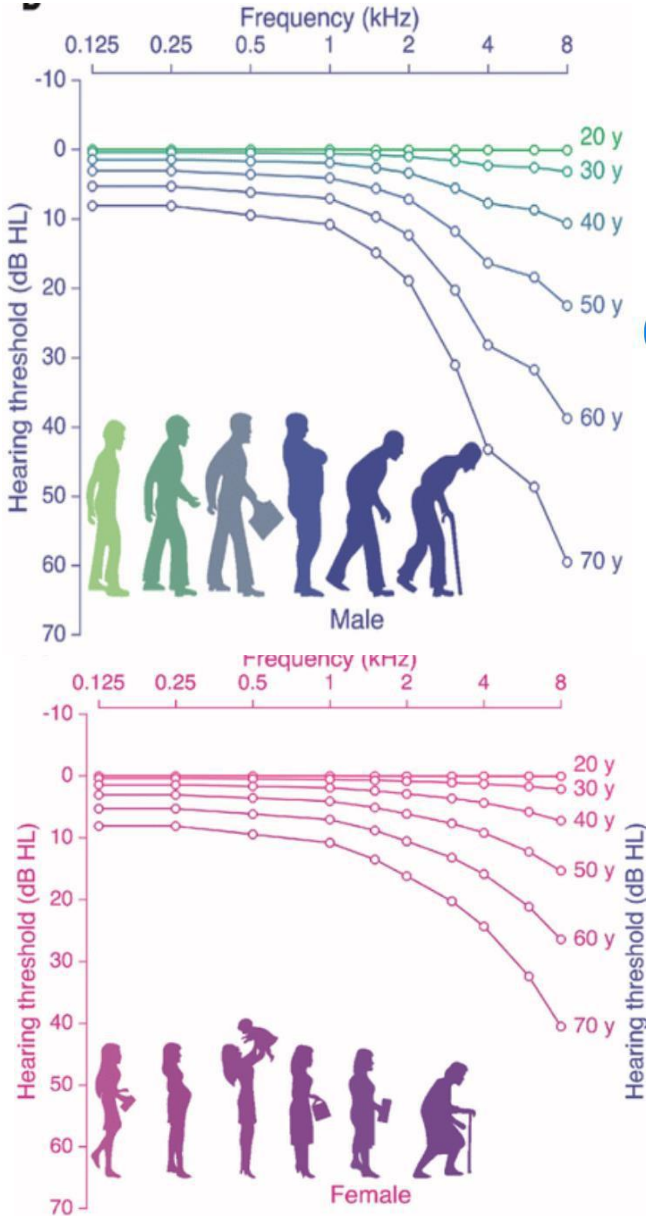
Age is the biggest single cause of hearing loss

We begin to lose a small amount of hearing 30 to 40 years old.

By the age of 80 most people will have significant hearing problems

As hearing starts to deteriorate, high-frequency sounds, such as female or children's voices, may become difficult to hear.

This can make understanding speech in background noise very difficult.

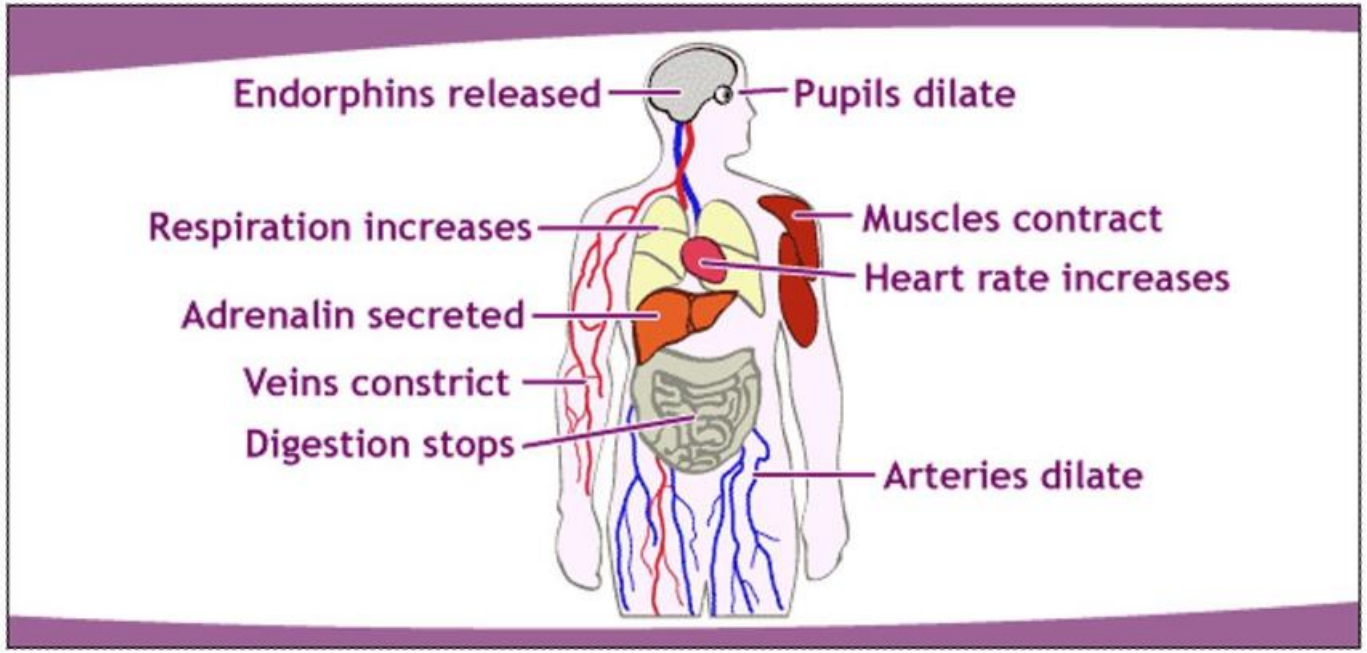


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Unwanted or harmful sound

Noise is recognized as a source of stress, causing a physiological reaction in our body.

It affects our ability to undertake common tasks especially those requiring memory and reading



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The five senses:



Sight

Hearing

Smell

Taste

Touch

- Manage sensory stimulation through design
  minimise unhelpful stimulation
  maximise helpful stimulation
- Allows people to build on their strengths
- Support engagement

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Dementia design principles applied:

a quick look in the toolbox for retrofitting

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Colour theory

Hue is typically described by the name ((red, blue, green)

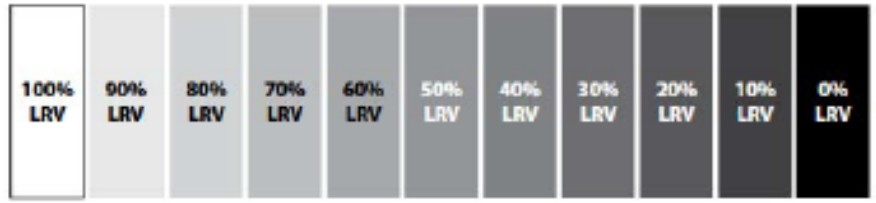


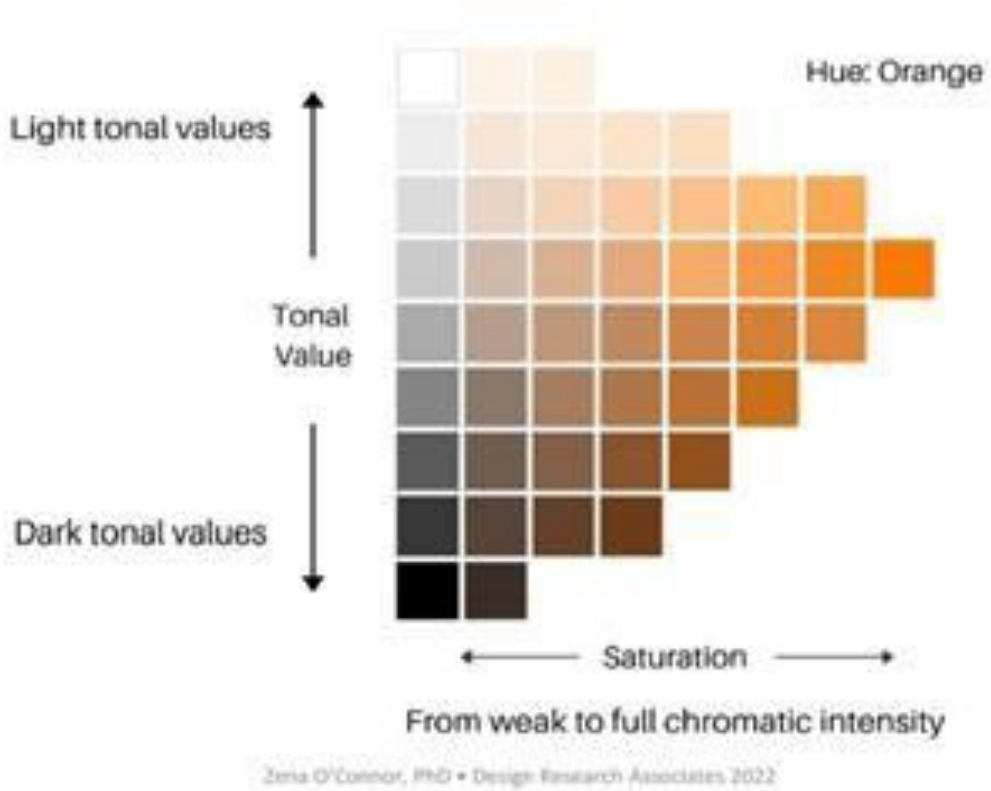
Saturation is typically described by the depth of colour



Tone describes how much light reflects on the surface by a value system of 0-100%
This is sometimes described as brightness or contrast







O'Connor, Z. (2022). *Colour for Engagement, Orientation and Wayfinding in Aged Care and Dementia Care*. Resene.

Light reflectance values (LRV) Light Reflectance Values (LRV) are a measure of the percentage of visible and usable light that is reflected from a surface when illuminated by a light source. The numerical value in LRVs represents tone and does not represent hue or saturation values of a colour. Therefore, when considering contrast, it is the tone that is relevant.

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Using tonal contrast

Some colours (hue's) can appear similar to someone with a visual impairment but reflect the same percentage of light from it's surface. This is expressed as LRV.

Tonal contrast can be used to make objects or surfaces appear or disappear to advantage.







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Tonal contrast for surfaces / critical planes (walls, floors, doors, skirtings, toilet seats) should have a minimum of 30% contrast.

Where no contrast is required, a maximum of 10% (preferably 8%) contrast should be provided.



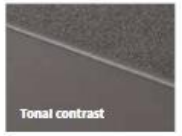
DO'S AND DON'TS

Here are some examples of these principles in practice, as well as what to avoid when designing a scheme.

DO – DARK FLOORS
0-10 LRV



It is not always possible to achieve 30 degrees of contrast between walls, skirting and floors. When this is the case, it is essential that optimum contrast is achieved between the two critical planes; the floor and wall.



DO – DARK FLOORS
0-10 LRV



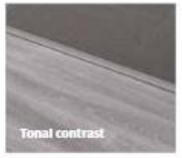
Where it is possible to abut flooring without a transitional strip, this is preferred, as this will reduce the number of interfaces to be coordinated. However, ensure the flooring is level; floor thicknessses can vary.



DO – MID TONE FLOORS
11-40 LRV



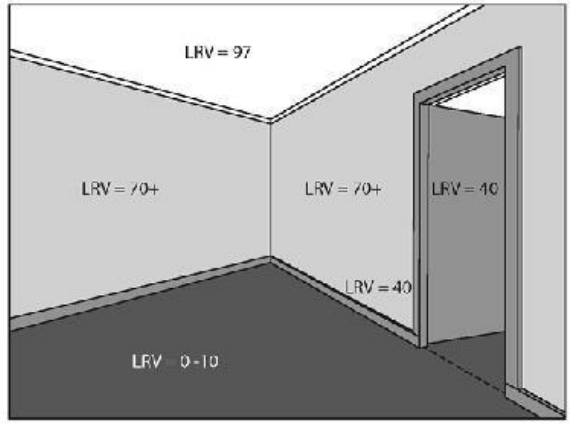
Adjoining flooring should not contrast more than 10 degrees of light reflectance value. In this example there are 9 degrees of contrast between the two floors.

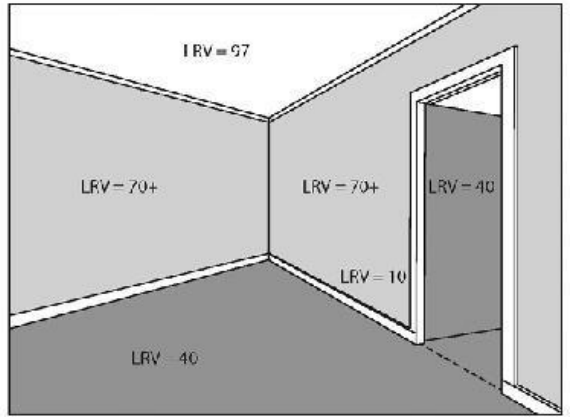


DO – LIGHT FLOORS
41-60 LRV





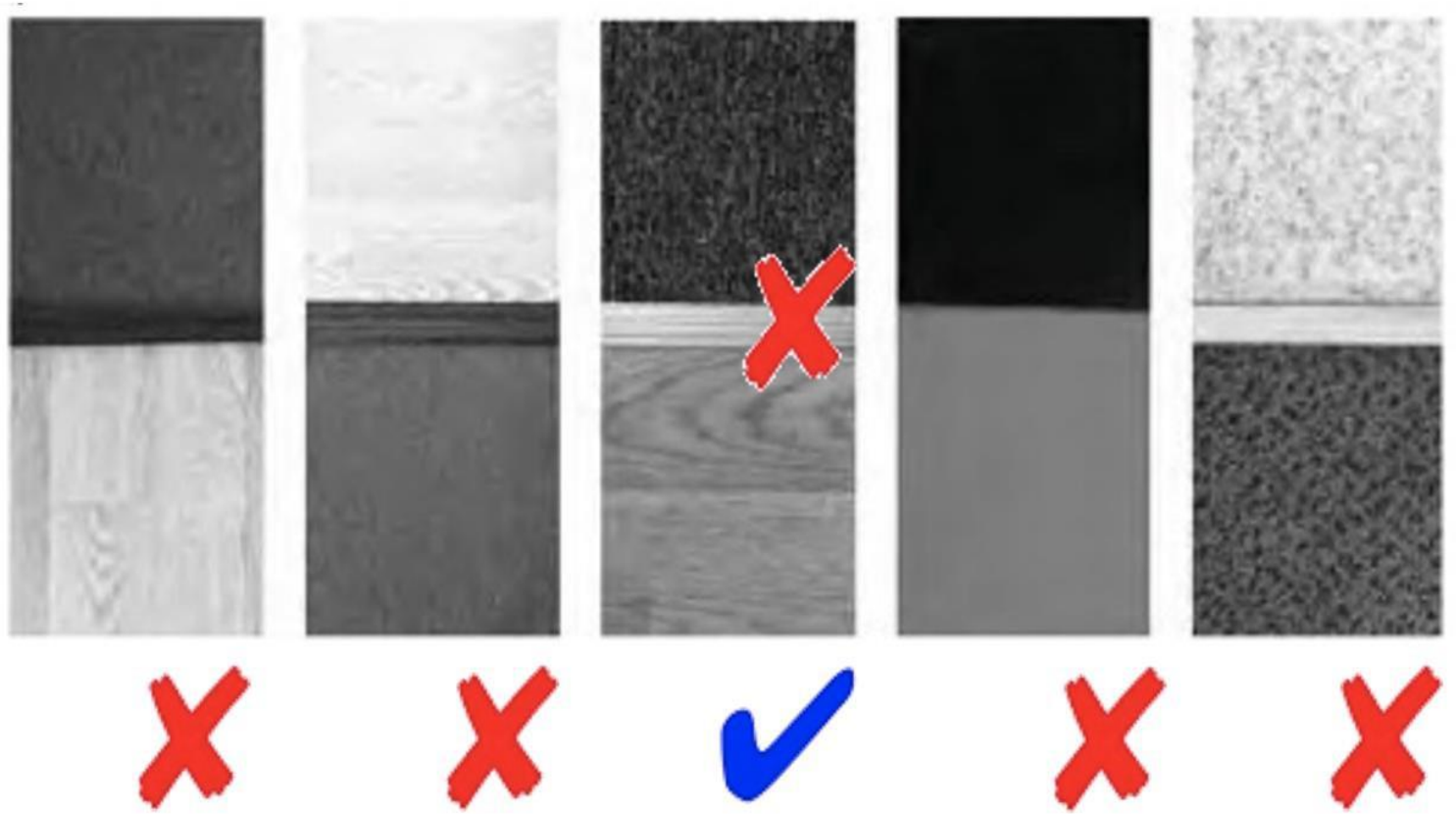




Using no tonal contrast for flooring

Tonal considerations in the environment:

No tonal contrast between adjoining level floor finishes.



Using no tonal contrasts for mats



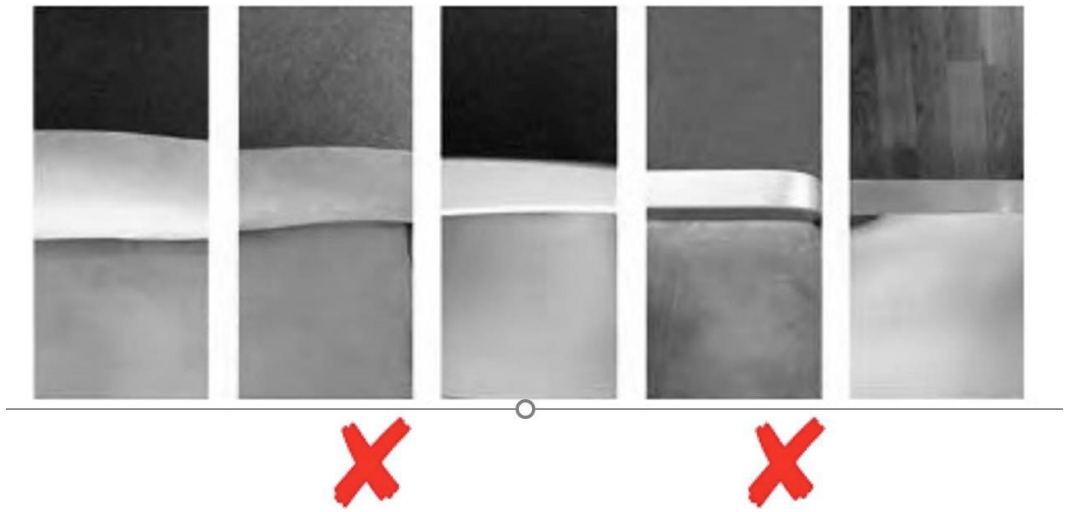




Using tonal contrast for seating

- Tonal contrast between the seat of the chair and the floor below.
  This will reduce likelihood of inaccurate positioning on the seat of the chair.
- Also contrast the seat with the arms of the chair.
- Piping can be used to provide contrast





Colour psychology in dementia

The relationship between colour and emotion have been very effectively popularised through the architecture and design literature (Birren, 1982; 1973; 1959; 1950). This is highly regrettable as the relationship between colour and mood is a very complex one and the studies which have examined this issue are plagued with problems. p22



Dalke, H., & Matheson, M. (2007). Colour Design Schemes for Long-term Healthcare Environments (London). Kingston University.

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Journeys

Little work has been done on what defines an environment as having visual comfort, incorporating accessibility and contrast.

Yet contiguous spaces - a bedroom, corridor and dayroom - may be all that patients, service users, clients and residents experience; a sequence of these spaces maybe the only 'journey' they make.







Dalke, H., & Matheson, M. (2007). Colour Design Schemes for Long-term Healthcare Environments (London). Kingston University.

Paler, less saturated colours are preferred across all the hues (Dalke et al, 2007)

A room in a different colour from others in an establishment can encourage service users to visit that space, e.g.a blue room in an otherwise all pink building. (Dalke et al, 2007)





As a lived experience expert who provides advice on environmental design including interior design to quite substantial projects in Singapore, I would say pastel colours would be preferred for wall colour and wallpaper. The low-saturation makes it more comforting and calming to our senses. Patterns like floral can be subtly incorporated into the design without overwhelming the senses and yet, provides the aesthetic taste



Voice of expert by experience Emily Ong

As a mere person with dementia (PCA), my tuppence Ha'worth is that bright colours are triggers for "challenging behaviour" (unmet needs; overstimulation). Contrast is ok but bright colours a big no. As my dementia starts at the back I believe I am experiencing what those in Care Homes do.

I have never understood the reasoning behind bright (highly saturated) colours, presumably because those living the experience can't explain.

Black doormats are a form of imprisonment as we see a black hole; too often used, maybe not always deliberately.

Early symptoms of posterior cortical atrophy include blurred vision, difficulties reading (particularly following the lines of text while reading) and writing with non-visual aspects of language preserved, problems with depth perception, increased sensitivity to bright light or shiny surfaces, double vision and difficulty seeing clearly in low light conditions. The patient may have trouble accurately reaching out to pick up an object. As the disorder progresses, other symptoms evolve such as getting lost while driving or walking in familiar places, misrecognition of familiar faces and objects, and rarely visual hallucinations. Calculation skills and the ability to make coordinated movements are affected in some cases.



Voice of expert by Martin Robertson (UK)

Key recommendations on colour & pattern

- Use differently designed or coloured furniture, different colour schemes, or different wallpaper so that different places are clearly distinguishable

- Use a unique colour in the quiet lounges to encourage residents to use them.

- Avoid the use of brightly coloured (high saturation) objects if they are not being used as navigational aids

- Use highly saturated colours as navigation aids - do not repeat these colours when they are used in corridors or this will cause confusion

- Create a journey through the building by painting the corridors and rooms different colours - use colours that are adjacent on the colour wheel.

- Use less saturated colours for large areas of wall





Do not use wallpaper that:

- ❖ is highly saturated in colour - use paler colours with low saturation
- ❖ contains repetitive patterns with a high level of contrast - for example striped wallpaper should have stripes of the same LRV
- ❖ is hyper-realistic - use a painterly design
- ❖ is densely patterned without negative space
- ❖ has multi-hued patterns - use patterns that use colours that are contiguous or different tones of the same hue.



Tips & tricks



Due to natural thickening of the lens of the eye with age, older people may experience colors as ‘washed out’ and find blues, greens and purples harder to differentiate.

Tip: Adding a feature wall can give a room a more 3d quality which will aid in navigation



Finding the edge of curtains can be difficult for people with dementia.

Tip: Adding a contrasting leading edge can help them locate the edge of the curtain for opening and closing.



Some fabrics can provide too much visual noise.

Tip: Create double sided cushions or duvet covers that can be turned over to provide a more calming or more stimulating environment to suit different needs.

Signage



- Clear and Simple: Brief messages with essential information only. Use sentence case in a sans serif font.
- High Contrast: Bold text on contrasting backgrounds (e.g., black on yellow)
- Dual Coding: Combine text with relevant, recognizable images
- Consistent Placement: Position signs at eye level and in consistent locations
- Appropriate Size: Larger text with sufficient spacing between letters and words
- Visible Location: Place signage at decision points (hallway intersections, doorways)
- Clutter Free: Remove unnecessary signs and ensure the sign is the only object in that location

Enabling kitchen activities







Enabling dressing activities







Where to from here?

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Managing refurbishments

Key insights from a recent project:



Phased Impact: Recognising that each stage of construction - pre, during, and post - brings unique challenges for residents, families, and care and construction staff.



Minimizing Distress: Implementing strategies to reduce noise, confusion, and disruption during renovations.



Residents First: Balancing construction needs with maintaining a safe, familiar environment for vulnerable residents.



Stakeholder Communication: Keeping residents, whānau (family), and staff informed and involved throughout the process.



Beyond Physical Changes: Ensuring that significant upgrades, like fresh cook kitchens, are accompanied by comprehensive staff development programs.

Thank you – I hope it's been helpful

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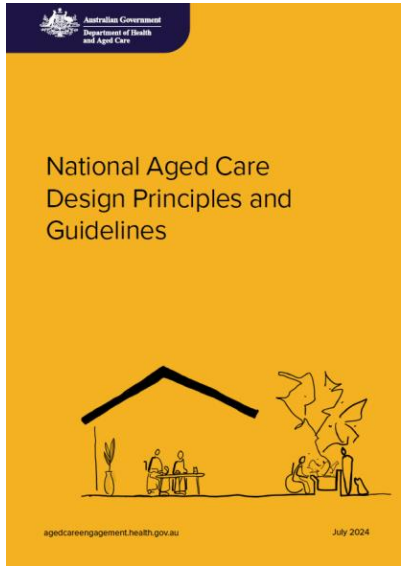
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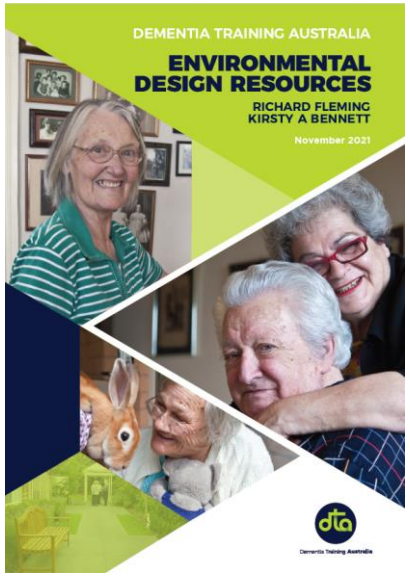
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Some example design guides











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