

# **Secure Dementia Care Home Design**

## **Information Resource**

**A person-centred perspective**



## Acknowledgements

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# Introduction

The aim of the *Secure Dementia Care Home Design Information Resource* is to support people involved with the development or major reconfiguration of secure dementia care homes, and to enhance the quality of life of people living in them. It approaches these aims from a person-centred perspective. It is based on current research, consultation with New Zealand stakeholders and international guidelines. This resource focuses on the experience for the person with dementia.

This resource provides in-depth information and research for aged care providers, DHBs and anyone else planning and designing new builds or reconfiguring secure dementia care homes. This is an information resource only, it will not be included in the audit process. The design principles are relevant to all people living with dementia in both non-secure and secure care homes. However, this resource is specifically designed for secure dementia care homes, rather than other (non-secure) residential aged care built environments.

## Structure

The complete research and consultation background data used to form the basis for each resource topic is presented in two documents.

The full Information Resource (this document) begins by presenting a background on dementia in general and the dementia care context in New Zealand. It provides design principles for secure dementia care homes, along with accompanying research rationales. It orders topics under three overarching headings:

- dignity, human rights and person-centred care
- cultural identity
- design principles.

A summary document presents the design principles concisely, for easy access.

It is recommended that designers of secure dementia care homes consider other documents that guide the provision of services in New Zealand, such as the Health and Disability Service Standards and DHBs' Aged Related Residential Care (ARRC) contract.

# Background

The environment in which a person with dementia lives can be a positive therapeutic intervention on its own, regardless of the type of health care that person receives (Day et al 2000; Zeisel et al 2003; Fleming and Purandare 2010; Marquardt et al 2014).

This resource is a tool for all those concerned with the development, expansion or reconfiguration of secure dementia care homes. It is based on research evidence, consultation with New Zealand stakeholders and international guidelines.

## Types of aged residential care in New Zealand

In New Zealand, aged residential care (ARC) facilities provide four types of care: rest home care, dementia care, hospital level care and psychogeriatric care.

Hospital level care is for people with the highest health care needs, while rest homes cater for more mobile and independent people. The staffing mix in these two types of care reflects residents' varying needs. Care homes providing hospital level care must provide a registered nurse (RN) 24 hours a day. Rest homes provide 24-hour health assistant care; an RN is available during the day and on call after hours.

Secure dementia care homes are a subset of rest homes. The main difference between rest homes and dementia care homes is that dementia care homes are safeguarded to maintain the personal safety of the people in them. Psychogeriatric care homes are a subset of hospital level care. Typically, people in psychogeriatric care have high dependency needs, and exhibit challenging or antisocial behaviour (such as aggression, overly intrusive wandering and the potential for self-harm or inappropriate interpersonal relationships) as a result of dementia or psychiatric disorders. Psychogeriatric care homes employ staff skilled in psychogeriatric care and, like dementia care homes, are secure. People undergo a specialist assessment before being admitted to either a dementia care unit or psychogeriatric care unit.

District health board Needs Assessment and Service Coordinators (NASCs) assess the funded and non-funded care needs of individuals, determine the level of care they require and recommend an appropriate placements for them at one of the four different levels of care delivered under contract by DHBs.

This information resource focuses exclusively on secure dementia care homes.

## Previous guidelines

In early 2002, a report to the Disability Issues Directorate in the Ministry of Health, *Dementia in New Zealand: Improving quality in residential care* (Lewis 2002) outlined concerns expressed by advocates for people with dementia in relation to the safety and quality of care delivered in residential settings. The report highlighted the need for consistent approaches and quality assurance systems for dementia care in New Zealand, and made 26 recommendations to the Minister of Health.

Recommendation 18 proposed the development of a dementia-specific residential standard, envisioning that the standard could be incorporated under the Health and Disability Services (Safety) Act 2001. Accordingly, Standards New Zealand published an audit workbook and guidance in 2005: SNZ HB 8134.5 *Health and Disability Sector Standards – Proposed Audit Workbook and Guidance for Residential Services for People with Dementia. (Residential) Audit Workbook*. It was designed to be used alongside SNZ HB 8134.1 *Health and Disability Sector Standard (Residential) Audit Workbook*.

The aspects of SNZ HB 8134.5 that pertain to the physical environment appear under the service criteria 'Safe and Appropriate Environment'. They state that the physical privacy of consumers/kiritaki is met during the provision of services and that consumers/kiritaki:

- are provided with adequate space that promotes safe mobility and freedom of movement (independent or assisted)
- are provided with habitable areas appropriately furnished to meet their needs
- are provided with adequate toilet/shower and bathing facilities
- are assured privacy for personal hygiene requirements or when receiving assistance with personal hygiene
- are provided with adequate personal space/bed areas appropriate to the consumer/kiritaki group and setting
- are provided with safe, adequate, appropriate and accessible areas to meet their relaxation, activity and dining needs
- receive an appropriate and timely response during emergency and security situations
- are provided with safe and adequate external areas
- are provided with adequate natural light (at least one external window in personal/living areas), safe ventilation and an environment maintained at a safe and comfortable temperature.

In an appendix (p 248), the Guidance provides details about care home size:

For new specialist dementia units (this includes specialist rest homes or specialist hospitals) it is recommended that there are clusters with a maximum of 12 beds with separate living areas per cluster.

It also includes a design philosophy that explains concepts such as home, independence, identity and community (p 248):

The objective in designing a residential care home for people with dementia is to create a homelike environment that is familiar, culturally appropriate, encourages independence and reinforces identity and memory, while reducing risk and minimising harm.

Lewis (2002, p 30) made three recommendations regarding the physical environment of a dementia care home, based on literature reviewed at that time.

- A move towards small-scale homely, domestic style environments (along with age appropriate furniture and décor) designed to maximise awareness and facilitate healthy living for people with dementia. Privacy as well as safety issues must be taken into consideration.
- Social, psychological, artistic, and communication needs should be given equal weighting to physical needs.
- Planning to achieve optimal environmental arrangements will require co-operation among all providers of care, including carers, whānau, family and health professionals. Better co-ordination of non-residential and residential services will also be required. Planning will also need to take into account the range of dependencies of people over time ie, assessment and reassessment of needs.

# The new resource

The status of SNZ HB 8134.5 has remained 'proposed'.

The workgroups convened to develop this information resource in 2015 discussed previous attempts to develop guidelines. Participants noted that there were two main sources of concern for providers about any potential guidelines – economic implications, and concern that their existing facilities will not comply with newly defined standards.

In addition, the workgroups noted the following barriers to implementation of SNZ HB 8134.5.

- The workbook tool was ambiguous.
- The roles of HealthCert and the DHBs in relation to the audit tool were not clear.
- The distance between the prevailing culture of provision and the principles in the workbook was too great.

Workgroup participants were asked what would facilitate the adoption of guidelines in the future. They made the following suggestions.

- Avoid being too prescriptive about care home size, due to the economic implications. Understand and address these economic implications.
- Avoid being too prescriptive such that innovation is constrained.
- Clearly differentiate between aspirational guidelines, regulations and minimum standards.
- Celebrate what is done well – illustrate guidelines with New Zealand exemplars.
- Make the guidelines a clearing-house for innovation, experience and resources.
- Ensure that HealthCert and the DHBs interpret and implement the guidelines consistently.
- Ensure that HealthCert and the DHBs are consistent in managing applications for new builds or reconfigurations (with each other), and reduce variability between DHBs.
- Foster early engagement with the DHBs regarding new builds, and ensure that the process of approval is more predictable.
- Make sure that guidelines are freely available to architects, providers, clinicians and families, and that they are linked to local councils.

The remainder of this document is based on current research, informant feedback and international guidelines for the design of secure dementia care homes in New Zealand, and is divided into three sections:

- dignity, human rights and person-centred care
- cultural identity and Māori and bicultural aspects
- design principles.



# Dignity, human rights and person-centred care

Upholding basic human rights forms the foundation of secure dementia care home design: preserving the dignity of people with dementia even though they require a secure care home, which by its very nature restricts personal freedom. There is an inherent tension between ensuring a person's safety and promoting their autonomy and quality of life. It is essential that personal dignity and person-centred care form the bases of care home design.

The Human Rights Commission has considered those cared for in secure dementia care homes to be subject to the human rights protections afforded to any detained persons. As such, their rights include the right to receive care that provides adequate staff training, as well as access to outdoor space and equipment suitable to promote health, exercise and recreation (Human Rights Commission 2014).

The 2015 New Zealand consultation workgroup participants provided the following considerations for a person-centred care approach.

- Providers facilitate person-centred care by offering personal space, a variety of flexible spaces, and the ability to choose how to occupy space and how and when to socialise.
- Person-centred care is delivered through models of care, philosophies of care and staff training – it is much more than just the environment.
- Collaboration between families and care staff is critical to person-centred care.
- Care home size determines staff's ability to really know the people they care for and to respond differentially to their needs, thereby providing person-centred care.

Dignity relates to the notion of human worth, which is universal and inherent, as well as the dignity of identity – autonomy, integrity, self-respect. Burgess (2010) defines dignity as 'a quality in the way people are treated and respect is one measure of this quality', going on to note that 'Dignity is also . . . used to describe how you can appear or behave' (p 2). Dignity can be conceived as a constraint on behaviours or as a tool of empowerment to reinforce the inherent value of human beings (Nuffield Council on Bioethics 2009). Relevantly for dementia care, aspects of identity can be threatened by external circumstances such as aging or illness (Nordenfelt 2004; Heggstad et al 2013). The design of secure dementia care homes in itself can promote people's dignity.

Dignity is conceptualised in various declarations as a basic human right, independent of any condition including age or disability. The United Nations Declaration of Human Rights declares that all human beings 'are born free and equal in dignity and rights . . . and should act towards one another in a spirit of brotherhood'. The United Nations *Implementation of the International Plan of Action on Ageing and Related Activities* (1991) provides as follows.

14. Older persons should be able to enjoy human rights and fundamental freedoms when residing in any shelter, care or treatment facility, including full respect for their dignity, beliefs, needs and privacy and for the right to make decisions about their care and the quality of their lives.
15. Older persons should be able to pursue opportunities for the full development of their potential.
16. Older persons should have access to the educational, cultural, spiritual and recreational resources of society.

17. Older persons should be able to live in dignity and security and be free from exploitation and physical or mental abuse.
18. Older persons should be treated fairly regardless of age, gender, racial or ethnic background, disability or other status, and be valued independently of their economic contribution.

The New Zealand Code of Health and Disability Services Consumers' Rights sees patients'/consumers' dignity as an essential aspect of their interactions with health services, as follows.

**Right 1: Right to be treated with respect**

- (1) Every consumer has the right to be treated with respect.
- (2) Every consumer has the right to have his or her privacy respected.
- (3) Every consumer has the right to be provided with services that take into account the needs, values, and beliefs of different cultural, religious, social, and ethnic groups, including the needs, values, and beliefs of Māori.

**Right 3: Right to dignity and independence**

Every consumer has the right to have services provided in a manner that respects the dignity and independence of the individual.

**Right 4: Right to services of an appropriate standard**

- (4) Every consumer has the right to have services provided in a manner that minimises the potential harm to, and optimises the quality of life of, that consumer.

**Right 8: Right to support**

Every consumer has the right to have one or more support persons of his or her choice present, except where safety may be compromised or another consumer's rights may be unreasonably infringed.

In the United Kingdom, the Department of Health's *A New Ambition for Old Age: Next Steps in Implementing the National Service Framework for Older People* (2006) is part of the Government's response to ensure public confidence that care settings for older people treat people with respect. Part of the strategy is to stimulate national debate on the dignity and care of older people. The framework issued 10 dignity challenges; four relate to the physical environment, as follows (Burgess 2010).

**Dignity Challenge 3: Person-centred Care.** Older people should be treated as an individual by offering a person-centred care service. Staff should take time to get to know the older person receiving services and agree with them what services they require.

**Dignity Challenge 4: Autonomy.** Older people should be helped to maintain the maximum possible level of independence, choice and control.

**Dignity Challenge 5: Communication.** Older people should be listened to and supported to express their needs and wants. For those older people with communication difficulties or cognitive impairment, adequate support and advocacy should be supplied.

**Dignity Challenge 6: Privacy.** Respect people's right to privacy. Personal space should be available and accessible when needed. Areas of sensitivity which relate to modesty, gender, culture or religion and basic manners should be respected.

The Norwegian Ministry of Health Care Services introduced a similar 'Dignity Guarantee' in Norway in 2010. It stated that care for older people should uniformly promote dignity (Heggstad et al 2013).

Tranvåg et al (2014, p 4) noted that research on 'dignity-preserving dementia care' is sparse. Their own research found that access to, and the availability of, meaningful activities that use mind and body, as well as opportunities for work, were important contributors to a sense of dignity in people with mild to moderate dementia. This has ramifications for the physical design of dementia care homes.

# Cultural identity

People with dementia require ‘all possible coping resources, including those of one’s cultural heritage’ (Valle 1989, p 122) to preserve their sense of identity and maintain their orientation to the broader social environment (Day and Cohen 2000).

Participants in the workgroups noted the following requirements in regard to cultural considerations.

- Spaces must be varied and flexible enough to accommodate different kinds of families and different family, cultural and religious rituals, including visits by extended family (for example, the flexibility to allow a whānau member to stay overnight).
- There is a significant need for family space that is not the person’s bedroom.
- Staff need to understand the different cultural and religious practices and issues they may come into contact with.

Research about cultural aspects of design for secure dementia care homes is very limited. Day and Cohen (2000) observe that ‘culture has been largely neglected . . . in the design of environments for people with dementia’; many facilities are ‘designed for undifferentiated cultureless populations’. This may reflect a commonly held view that people with dementia share common losses in abilities and functionalities (Cohen and Diaz Moore 1999).

In fact, each person with dementia comes with a culture – ‘a way of life and a round of activities taken for granted until the point of admission to the institution’ (Goffman 1961, p 23). Different cultures perceive dementia differently, which may affect design. Australian Aboriginal communities, for example, may perceive mild dementia as ‘tiredness’ or a state of being ‘childlike’ and severe dementia as ‘madness’ (Pollitt 1997, p 158) rather than as a sickness.

## Research rationale

A recent review (Wu and Hou 2014) of the design of two aged residential communities (not specific to dementia) in Beijing and Shanghai, both modelled on Western-styled facilities, illustrates the importance of cultural context. The facilities were not as successful as the designers had hoped: people who lived there felt they did not cater to their context. Problems included the following.

- The design did not facilitate continued integration with the community.
- The buildings did not facilitate Chinese seniors’ custom to remain focused on their children and grandchildren.
- The design gave people who lived there ‘the feeling that they were abandoned by society’ (p 2840).
- People wanted kitchens rather than large dining halls, to engender a family atmosphere and make it possible to still have meals with their extended families.

Wu and Hou (2014) note the traditional Chinese perspective of drawing a sense of comfort and safety from being close to the earth, rather than in multi-level dwellings. They noted that, in particular, Chinese people wanted easy access to natural environments, so they could create vegetable gardens.

## Māori and bicultural aspects

Townsend and New (2011) investigated contemporary Māori views of dementia resulting from both spiritual and traditional beliefs. They noted that approaches to dementia care for Māori needed to be more holistic; the exclusion of Māori cultural values and understandings from service provision was detrimental to the wellbeing of older Māori.

‘I wouldn’t trust my Mum to go to any rest home . . . mainstream rest home services aren’t geared to respond to Māori in my view . . . as a consequence they can run the risk of being very abusive towards whānau Māori without even necessarily knowing that . . .’ Marama (Townsend and New 2011, p 92)

‘He was the first of our whānau that ever went into a rest home . . . it was traumatic actually . . . they really couldn’t come to terms with it . . . that is not what Māori . . . Māori don’t do that . . .’ Riana (Townsend and New 2011, p 94).

Townsend and New recommended enabling Māori to care for their older people within the home environment, in accordance with traditional values, and noted that health service delivery should be based in whānau, hapū or iwi structures.

Designing facilities with consideration for a particular cultural group requires attending to that group’s:

- history and life experiences (eg, immigration, discrimination or experience of war)
- characteristics (eg, educational levels or health status)
- beliefs and values (eg, attitudes to dementia, aging and illness)
- caregiving practices
- activities and behaviours (eg, hobbies or religious practices) (Day and Cohen 2000).

In December 2015, developers of this resource held a hui in Auckland with Māori representatives, including kaumatua and kuia. Much of the participants’ feedback echoed Townsend and New’s observations.

The participants noted that the term ‘dementia’ does not really translate to Māori. They suggested the term ‘porewarewa’.

Participants noted that the design of space for people with dementia needs to be respectful of who individuals are and what they need, echoing the person-centred design principles that are the basis of this information resource. Participants noted that the function of a care home needs to be clear before the form is designed, and that it is impossible to separate a built environment from a model of care. Participants remarked that sustainability and financial issues are important, but are not the only thing that is important for Māori. Some participants noted that the Māori basis for design was the marae: one older Māori person noted ‘our home was our marae’.

Participants made the following points.

- Whānau are responsible for older Māori people, no matter where they reside or the level of care they require. It is important to make sure there is whānau space separate from the older Māori person’s bedroom, and common space.
  - There needs to be space in which whānau may ‘co-care’ for older Māori people in dementia care homes.
  - There needs to be space for children and other whānau to feel comfortable in when visiting and caring for older Māori people.
  - There needs to be room for whānau to help with end-of-life care.

- There needs to be a high degree of flexibility in the space, so that it may be used for different purposes.
- Dementia care homes would be therapeutic for Māori if they were structured like a marae.
  - A care home needs to be designed so that it does not feel like a ‘prison’, and feels familiar to the older Māori person.
  - Local iwi and hapū can provide carvings and other important cultural aspects to enhance the environment.
  - A design that incorporated a hub with lodges around it would be ideal.
  - Dementia care homes need to incorporate areas where the function of the marae can occur.
- Other specific considerations included the following.
  - Burying a mauri stone is a mark of respect to Papa, the earth mother, and bestows a blessing on a site and the buildings placed there. The stone is planted under the earth with incantations and karakia (prayer). Those responsible for building care homes need to discuss the burying of the mauri stone with local iwi.
  - Gardens should be kai, not flowers, and be for the purposes of providing a meal. People could help with the gathering of the harvest, thereby acknowledging the cycle of the seasons.
  - There needs to be a place where whānau can prepare and have a meal together.
  - Trees such as kowhai, cabbage tree and pōhutukawa are useful as a way of orienting older Māori people to the seasons and the traditional activities for each time of year.
  - Space is needed for traditional healing practices and karakia.
  - Running water represents alignment with the gods and the value of water to man. Participants noted the importance to elders of being able to hear water moving (like a fountain). This is often important to a person’s sense of their essence. A participant noted that ‘if you can’t see or feel water it isn’t quite right’.
  - One participant noted the need to have access to gardens to feel they have their ‘feet on the ground’.

Participants expressed the need for more Māori to own and run dementia care homes with a specific Māori perspective, and for collaboration between DHB Māori health and local iwi and hapū. More research is needed about the impacts of culture on design of secure dementia care homes.

# Design principles

## Introduction

There is growing consensus that well-designed care homes can enrich the quality of life for people with dementia living in secure dementia care homes. Clear principles have emerged to guide the design of long-term care environments for people with dementia (Fleming et al 2008; Fleming and Purandare 2010; Fleming et al 2015). Responsive environmental modifications can enhance an individual's ability to function by decreasing the cognitive demand of navigating their surroundings (Calkins 2002).

In the 1970s, Lawton was an early researcher into the interaction between people with Alzheimer's disease and the physical environment. He developed an 'ecological model of competence', which has become one of a number of ways to view the role of the environment on behaviour. The model's central premise is that an environment that makes high demands (or 'environmental press') on its inhabitants has a negative impact, especially on older people (Lawton and Nahemow 1973).

Another pioneer in this area was Professor Mary Marshall (Marshall 1990; Marshall 1998a; Marshall 1998b; Marshall and Tibbs 2006), whose early work in dementia care led to the establishment of the Dementia Services Development Centre (DSDC) at the University of Stirling in 1989 (Personal Social Services Research Unit, University of Manchester 2005). The DSDC has had considerable influence, both in the United Kingdom and in Australia. Subsequently, Australia led the world with its National Action Plan for Dementia Care in 1992 and the establishment of five government-funded Dementia Training Study Centres in 2006.

Marshall recommended that dementia care homes:

- be small
- have the ability to control stimuli – especially noise
- have good visual access – so people can see what they need (eg, toilet/bathroom)
- have unnoticeable safety features
- have rooms with different furniture themes/styles, appropriate for residents' varying age/generation
- have single rooms big enough for a reasonable amount of personal belongings (memory triggers)
- be domestic and home-like
- feature facilities to enable ordinary household activities (clotheslines, garden sheds, kitchens)
- provide a safe outside space
- provide good signage and sight, smell and sound cues, and use objects rather than colour for orientation.

Marshall's key design principles for dementia care homes (set out in 1998b) arguably provide the quality standard. Fleming et al 2015 and Fleming and Bennett 2015 cite significant empirical support for these principles, which include:

- compensation for disability
- maximising independence
- enhancement of self-esteem and confidence

- demonstration of care for staff
- ability to be orientating and understandable
- reinforcement of personal identity
- welcoming of relatives and the local community
- allowance for the control of stimuli.

Based on research evidence, Fleming and Bennett (2015) incorporated eight design principles into their development of the *Environmental Assessment Tool* (see Appendix; Fleming et al 2012; Fleming and Bennett 2015):

1. unobtrusively reduce risks (be safe and secure)
2. provide a human scale (eg, 'family-sized' clusters and a low number of people per care home)
3. allow people to see and be seen (be simple and provide good 'visual access')
4. manage levels of stimulation:
  - reduce unhelpful stimulation
  - optimise/highlight helpful stimulation
5. support movement and engagement (provide for planned wandering)
6. create a familiar place
7. provide a variety of spaces that provide opportunities to be alone, with others, or with others from the community
8. respond to a vision for the values and goals of care (eg, domestic and home like).

The consultation process for this resource found general agreement with these principles. However, some respondents noted that connection to the wider community was missing as a basic principle. Respondents also noted that the size of a care home should be a core principle, and that design of physical space could not be separated from models of care. Workgroup participants noted the inherent tension between security and safety and quality of life, and said that too much emphasis on risk reduction can impoverish a person's quality of life.

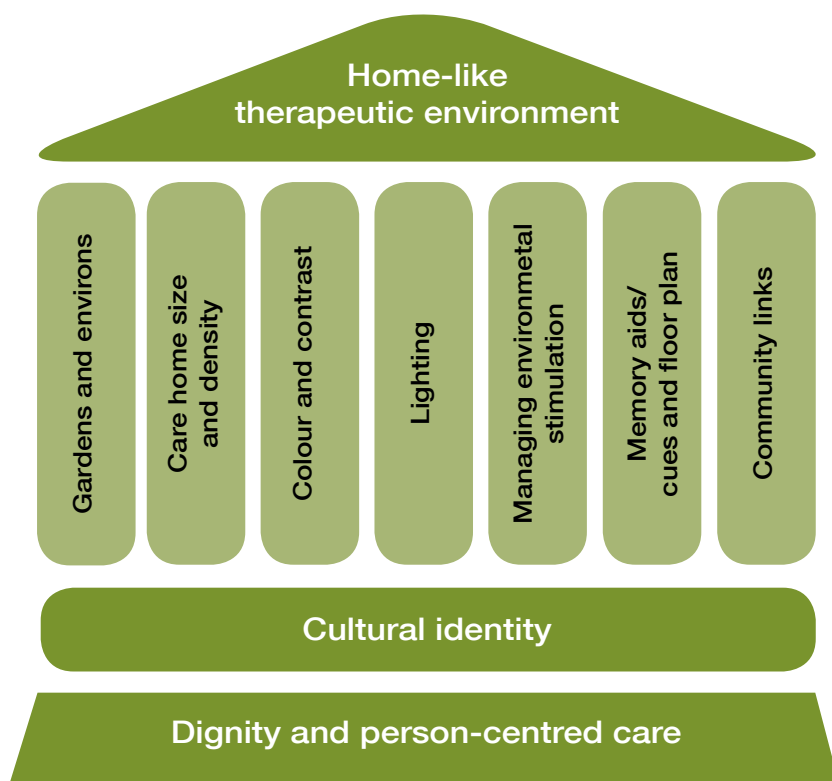
In 2014, Marquardt et al undertook another robust systematic review on the impact of design and the built environment on people with dementia. They noted that the lack of quality evidence available on this topic reflects the difficulty of research, specifically because of the ethical dilemmas inherent in gaining consent from those with cognitive impairment: there have been few randomised controlled trials or studies with large samples. However, they noted that lower 'quality' studies do not necessarily signify a lower value being placed on design for dementia care homes.

The remainder of this resource explores design principles in more detail under the following headings, citing relevant available research:

- home-like therapeutic environment
- gardens and outdoor environs
- care home size and density
- colour and contrast
- lighting
- managing environmental stimulation
- memory aides/cues and floor plans
- community links.

The following figure shows the philosophical basis and the features of well-designed secure dementia care homes.

**Figure 1: Schematic overview of design principles**



## Home-like therapeutic environment

### New Zealand perspective

Workgroup participants suggested that what makes an environment ‘home-like’ is a mix of ‘seeing’ and ‘doing’; that is, a home-like environment is age-appropriate, looks familiar (provides cues to enable a person to recognise the place as a home) and facilitates domestic activity. Participants noted that care home design and the model of care need to enable meaningful activity that promotes social wellbeing.

There was much debate about the place of multi-storey buildings within New Zealand culture, and the extent to which a ground-floor location is important.

In terms of the design of secure dementia care homes, ‘homeliness’, ‘home-likeness’ and similar words attempt to describe a non-institutional living environment. A homelike environment includes a living room, dining room, kitchen, homelike furnishings, and objects and artefacts that carry personal meaning to inhabitants.

The following components are important determinants of a ‘home-like’ environment.



Components	Detail
Design is to a human, domestic scale	<ul style="list-style-type: none"> <li>• No long corridors</li> <li>• ‘Clustered care’ – a family-like setting (Some participants thought that the ideal number of people living together was between 5 and 12, as commonly found in the disability sector, but others noted that this was not always economically feasible. There was a general consensus that there should be no more than 20 people in one care home, as specified in the current Age Related Residential Care (ARRC) contract.)</li> <li>• Common spaces, kitchen, sitting area and dining area of a domestic size</li> <li>• Domestic furniture</li> <li>• Domestic focus points (eg, kitchen table, fireplace)</li> <li>• Domestic scale and domestic appearance – familiar</li> <li>• Domestic dining experience</li> <li>• No internal rooms – each room should have windows</li> <li>• Lack of clutter (eg, no equipment stored in corridors)</li> <li>• Heating systems to accommodate the needs of frail older people</li> <li>• Incontinence management considerations (everything easily cleaned)</li> </ul>
A variety of communal spaces facilitate family and community engagement, and personal choice	<ul style="list-style-type: none"> <li>• ‘Hosting space’ where friends and family can go that is not the bedroom</li> <li>• Spaces such as sunrooms, decks and libraries</li> <li>• Gardens</li> <li>• Quiet places</li> <li>• Space to accommodate extended family for family events (eg, celebrating birthdays or other ceremonies) appropriate for a variety of cultures</li> <li>• Cues to welcome different cultures</li> <li>• A pet-friendly environment</li> <li>• A child-friendly environment (eg, children’s play areas)</li> <li>• Spaces to show or create art</li> </ul>
People can easily personalise their individual space	<ul style="list-style-type: none"> <li>• Opportunity for people to have their own furniture and curtains</li> <li>• Allowance for pictures and familiar things in people’s own rooms</li> <li>• Comfortably sized rooms, with space for furniture as well as equipment needed to provide care</li> </ul>
Design facilitates people’s independent domestic activity	<ul style="list-style-type: none"> <li>• Easy access to a communal kitchen</li> <li>• Opportunity for people to access domestic spaces and undertake a variety of household tasks</li> <li>• Potentially raised garden beds, a working shed, a clothesline</li> </ul>
Design facilitates visual and physical flow between indoors and outdoors	<ul style="list-style-type: none"> <li>• Opportunity for people to engage with the outdoor environment</li> <li>• Freedom to walk around – places to go</li> <li>• Cues for meaningful activity – clothes line, working shed, mailbox</li> <li>• Decreased obviousness of entries and exits</li> <li>• Designs that allow easy access to cars so staff or family can easily help people into a vehicle</li> </ul>
Security is unobtrusive	<ul style="list-style-type: none"> <li>• Unobtrusive boundary security – no obviously high gates or fences</li> <li>• Perimeter fencing that provides both privacy and a view to the outside community</li> <li>• Philosophy of care that allows for reasonable, supported risk-taking, on the understanding that an overly restrictive approach to risk can impoverish the environment and people’s lives</li> <li>• Systems that allow family and friends to enter easily</li> </ul>

## Research rationale

Fleming et al (2015) found that the built environment needed for people with end-stage dementia and their families/carers should:

- support the use of the senses
- provide opportunities for social interaction
- provide opportunities for spiritual interaction
- provide familiarity and homeliness
- be calm
- have the means to control levels of stimulation
- provide opportunities for family to spend time with the person living in the care home
- provide privacy
- maintain the person's dignity (increasingly important as the dementia progresses)
- provide opportunities for people to be monitored by care staff
- make technology (especially communication technology) available.

Marquardt et al's 2014 systematic review of the literature found the following:

- improved quality of life (using a variety of measurements) among people in dementia care homes that had a homelike character and placed emphasis on personalisation (Minde et al 1990; Gnaedinger et al 2007; Charras et al 2010; Garcia et al 2012)
- less problematic behaviour in people whose rooms were personalised with elements such as wall decorations, ornaments and pictures (Morgan and Stewart 1999; Zeisel J et al 2003; Charras et al 2010)
- improved eating behaviour and an increase in communication in people living in care homes that consciously changed dining room seating patterns and worked to less institutional mealtime routines (Melin and Göttestam 1981; Göttestam and Melin 1987)
- more resident-directed conversations in a care home that created a homelike dining situation, where fewer people ate together (Roberts 2011)
- a decline in assaultive behaviour in a care home where the dining area was moved from a central area to the smaller living care home (Negley and Manley 1990)
- greater food and fluid ingestion in people who lived in a homelike environment (Reed et al 2005)
- reduced use of tube feeding among people who lived in a homelike environment where mealtimes were a more integrated part of daily life and health care assistants attached importance to hand feeding and advanced care planning (note that tube feeding is not as common in New Zealand as it is overseas) (Lopez et al 2010)
- a decrease in agitation in people whose home environment featured an unlocked door to a safe garden area (Namazi and Johnson 1992a)
- less agitated or disruptive behaviour in care homes in which room temperature was comfortable (Cohen-Mansfield and Werner 1995; Cohen-Mansfield 2007); uncomfortable room temperature has been associated with lower quality of life in people with late-stage dementia (Garre-Olmo et al 2012)
- a highly significant increase in activity and involvement (Milke et al 2009; Campo and Chaudhury 2012) and more time doing things for themselves among people in a household model care home (Morgan-Brown et al 2013)

- increased socialisation and reduction in agitation in people provided with companion animals (Baun and McCabe 2003)
- higher restlessness and anxiety and more violence among residents of buildings with a certain layout, specifically including long corridors (Isaksson et al 2009; Marquardt 2011).

## Gardens and environs

### New Zealand perspective

Participants in the workgroups noted that gardens and outdoor environments in secure dementia care homes do two things – they provide access and exposure to nature, known to be health-giving, and they provide the space for exercise and recreation (a basic human right). They are therefore essential, rather than optional.

There was considerable debate among participants as to whether this need can be met by a secure dementia care home in a multi-storey building. Some considered that the ARRC Service Agreement’s requirement could not be met by a balcony or a small partially enclosed space, and that a secure dementia care home must have independent access to a garden space large enough for therapeutic exercise.

Participants noted that gardens and outdoor spaces need to be designed to be therapeutic rather than ‘beautiful’. They noted that gardens should be allowed to be messy, and not over-designed.

The workgroups debated what constitutes the culture of New Zealand housing, including whether apartment living is now part of the New Zealand culture and therefore an acceptable model for dementia care. Some noted that, unlike people in secure dementia care homes, people who live in apartments can choose to leave them to visit parks and gardens. Workshop participants clearly stated that secure dementia care should be provided on the ground floor in order to offer independent access to safe outdoor space that provides an experience of nature and the space for exercise. This outdoor space needs to be sized appropriately for the number of people who will use it. Dementia care providers who build care homes on upper levels in New Zealand should take steps to ensure they meet the principles set out in this Resource, including independent access to an outdoor area.

The following components are important in terms of secure dementia care homes’ gardens and environs.

Components	Detail
Outdoor space is designed as an extension of indoor space	<ul style="list-style-type: none"> <li>• Visual and physical access between inside and outside</li> <li>• Opportunity for independent physical access from inside to outside</li> <li>• A transition between indoors and outdoors that is even underfoot</li> <li>• Appropriately surfaced and consistently coloured pathways</li> <li>• An entrance to the home itself that is homelike: no confronting signage and some garden elements at the entrance</li> </ul>
Outdoor space provides opportunity for walking	<ul style="list-style-type: none"> <li>• A continuous looped path with destination points but no dead ends (with well-placed benches and sheltered rest areas)</li> <li>• A space large enough for meaningful exercise and therapeutic benefit</li> <li>• Motion sensor lighting for night use</li> </ul>

Components	Detail
Outdoor space and garden is designed to provide opportunities for social interaction and engagement with the environment	<ul style="list-style-type: none"> <li>• Raised garden beds, shed, clothesline</li> <li>• Mixed spaces – large and small</li> <li>• Seating and tables</li> <li>• Sunny places and shady places</li> <li>• Space for animals</li> <li>• Space for children</li> <li>• Allowance for privacy but also for engagement with the surrounding community</li> </ul>
Outdoor space and garden is designed to provide sensory stimulation	<ul style="list-style-type: none"> <li>• Flowers, colour, water, textures</li> <li>• Seasonal variation</li> <li>• Vegetable gardens</li> <li>• Scented plants (to stimulate memory)</li> </ul>

The successful design of gardens for people with dementia is complex but important for many reasons, the greatest of which is the conservation of dignity. Access to the outdoors bestows a certain level of potential autonomy on people with dementia (Schwarz and Rodiek 2007), as well as affording them the opportunity to experience and enjoy nature.

Certain research has focused on use of garden and outdoor spaces, some commenting that underuse of the outdoors by people is often due to access or staffing issues (Cohen-Mansfield 2007; Gibson et al 2007; Grant and Wineman 2007; Hernandez 2007).

## Research rationale

Research into the interrelationship between outdoor space/garden use and people with dementia in long-term care facilities (Grant and Wineman 2007) has found that increased garden use by people resulted from an interrelationship of five factors:

- garden design – spatial layout, circulation routes, a variety of spaces (covered, private and group) and a variety of features (seating, shade provision, plantings, etc)
- physical access – doors that remain unlocked and open where possible, manageable access, no change in elevation, and a covered area at the access point
- visual access – views into the garden from inside the care home, and a garden entry that is visually accessible from the care home interior
- staff attitudes – staff who regard outdoor space as important, understand the benefits to people in spending time outdoors, and see independence as part of their quality of life
- organisational policy reflected in the mission statement, the education and training of staff and the programming of outdoor activities.

Existing comprehensive audit tools for the design of secure dementia care homes address outdoor access, gardens and environs. There are also checklists and audit tools specific to gardens and outdoor areas within secure dementia care homes. For example, the *Alzheimer's Garden Audit Tool* (Marcus 2007) is a comprehensive 74-point tool detailing general successful garden design features, as well as garden elements, for a dementia-friendly garden. These elements compensate for known changes in the cognition and physical abilities of people with dementia. The tool also acknowledges staff need for outdoor access. The major garden design features for assessment covered by the tool are as follows:

- location of and entry to the garden – visibility from inside, single entry 'landmark' door (where people can easily see how to get back indoors).

- doors unlocked and visible, entryway flooring flat and smooth (no glare), shaded entry with seating just outside, attractive garden view from entry patio, shade provision to avoid ‘sundowning’ (increased agitation at the end of the day)
- layout and pathways – appropriately surfaced and consistently coloured pathways with no dead ends or confusing choices, simple layout, destination points of interest, level pathways, handrails, width appropriate for wheelchairs, landmarks for spatial orientation
- a 70:30 ratio of green to hard surfaces, flat lawn large enough for a group of chairs, diversity in plantings (seasonal, multi-sensory, different heights, memory triggers (eg, plants popular in a specific relevant era)), provision for gardening activity
- seating – options for solitary or group seating, moveable and fixed seating, a mixture of shaded and non-shaded seating options
- design features that double as memory triggers (eg, mail boxes, garden sheds, bird feeders/baths)
- other enhancing features such as small-scale design changes along paths, plants to attract birds, a lack of slatted shadows
- a high level of maintenance and well maintained, attractive amenities.

All amenities relevant to where people need to go should be simple (Passini et al 2000) and located on the same floor as residents’ rooms (Marquardt 2011). Utton (2007) has published a detailed list of desirable features for outdoor and garden areas derived from research and design experience, as has Benbow (2014).

A 2014 literature review of 17 quantitative and qualitative studies into the impact of gardens and outdoors spaces on the mental and physical wellbeing of people with dementia in care homes found the following outcomes (Whear et al 2014):

- reduced agitation associated with visiting a garden
- reduced pacing and exit-seeking
- 19 percent less violence by people with dementia in the sites with gardens
- evidence to suggest a reduction in the type and frequency of medication use by users of a ‘wander garden’ with all day unimpeded access.

In addition, research has found that exposure to green environments improved people’s wellbeing, stimulated their senses, triggered memories, orientated them to the seasons, promoted social interaction and movement, gave possibilities for meaningful activities (eg, gardening) and supported their autonomy. In addition, such environments provided a sense of focus for staff (Rappe and Topo 2007; Whear et al 2014).

Other research findings on garden/outdoor use for people with dementia include:

- some improvements in sleep from increased time spent outdoors (Calkins et al 2007)
- reduced agitation among those with access to an unlocked door leading to a garden (Marquardt et al 2014)
- enhanced connections with the wider community (Innes et al 2011).

Other important considerations for garden/outdoor use for people with dementia include:

- encouraging people to connect with the outdoors and life outside their dementia care home, including through open windows for people unable to get outside (Rappe and Topo 2007)
- opportunity for exposure to direct sunlight for adequate vitamin D. Low vitamin D levels are associated with depression (Anglin et al 2013), dementia and Alzheimer’s disease (Littlejohns et al 2014)

- opportunities for pet walking, for growing flowers or vegetables, and for family members/carers to go outside with their relative when visiting. A quote from a person living in a care home: ‘There’s some nice sitting areas out there . . . when my nephew comes . . . on visiting day it was so warm [to sit] outside.’(Innes et al 2011)
- the fact that, as a source of multi-sensory stimulation for leisure and enjoyment, gardens are primary sites for experiencing nature and weather, or just ‘pottering’ (Gibson et al 2007).

## Secure dementia care home size and density

There was general consensus among workgroup participants that, in terms of dementia care home size and design, small clusters of people were desirable, as the research suggests people with dementia experience less agitation and distress in ‘family-sized’ care homes. However, there was no consensus on the ideal number of people per cluster or care home. Participants commented further that a variety of care home sizes and styles was appropriate, to give people a choice. Workgroup participants compared the institutionalisation and stigmatisation of dementia care to that arising in the context of treatment of people with mental health issues. The move towards small care homes of care in mental health was suggested as a model for dementia care (Peace et al 2002).

The following component is important in terms of dementia care home size and density.

Component	Detail
Secure dementia care homes are designed so that people live in small, independently secure clusters approximating a household	<ul style="list-style-type: none"> <li>• A number of clusters within one care home (independently physically constrained environment) as the best or most viable strategy</li> <li>• Acknowledgement of the critical interaction between the number of people and design of the space: larger clusters may be acceptable if there are multiple breakout spaces and the domestic dining experience is not compromised</li> <li>• Scale that helps people feel in control</li> <li>• Multiple clusters within a large care home to allow for the clustering of people with similar needs – people with dementia are not a homogeneous group</li> </ul>

There are many estimations of the optimal number of people in a cluster and in a care home. Regnier and Denton (2009) talk of the dining table size as reflecting the number of people per cluster (where a cluster is a home-like, self-contained set-up with a kitchen, dining table, living room, etc). Previously, authorities in Northern Europe held that the optimal size for secure dementia care homes was between six and eight people per cluster, and a total of 40 for the overall care home. However, more recently this number has drifted to around 10 per cluster and as many as 70 people per care home, for reasons of economy of scale (Regnier and Denton 2009). Zeisel, Hyde and Levkoff (1994) saw a maximum of 15 people living in a care home as ideal, and found that the most highly ranked dementia care homes had 7–15 people (Verbeek et al 2010). De Hogeweyk Dementia Village in Weesp, Netherlands, clusters people into groups of six in a ‘house’ within a care home that holds around 150 people (Schumacher Jones 2014). In 2012, Fleming considered 8 to 14 as an appropriate number of people within a care home. That study found that minimising the number of people a person with dementia interacts with reduced their overall confusion.

Fleming and Bennett (2015) determine that the scale of a dementia care home should be human and be governed by three factors:

- the number of people that the person encounters on a daily basis
- the overall size of the building
- the size of the individual components, such as doors, rooms and corridors.

Fleming and Bennett consider that ‘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 help the person feel in control’ (p. 3). It should be noted that implementing a goal of limiting and controlling unnecessary stimulation would preclude the practice of flexible clustering whereby (for example) people are part of a larger group during the day and return to smaller groupings at night.

The population density of the particular context must be considered. The 2013 New Zealand Census found that the average number of people per household in New Zealand was 2.7; this figure was the same in 2006. There are regional variations (Statistics New Zealand 2015).

## Research rationale

High-quality research into secure dementia care home size and scale has been difficult, as traditional research methods cannot capture fully the key issues: ‘Size has never been varied while all other conditions are kept constant and purpose designed small care homes are very likely to be homelike, familiar and safe’ (Fleming et al 2008, p 10). An additional problem is that the term ‘special care unit’ is not standardised. The two main measures of size for secure dementia care homes are the number of people in a care home and the area available per person (‘social density’). Calkins (2009) defines functional social density as the total area of ‘shared social spaces typically used by at least 20 percent of the people at least percent of the time, divided by the number of people.’ Calkins notes that ‘This gives a sense of how much shared social space each resident has, of spaces that are typically used’ (p 147).

Marquardt et al (2014) defined small-scale environments as catering for between 5 and 15 people and having homelike features. They reviewed 30 studies investigating this feature, and cited sufficient empirical evidence to support lower density of people in secure dementia care homes:

... there is strong evidence that small-scale care environments lead to positive outcomes for people with dementia and they should be implemented whenever possible. This is further supported by findings showing that a low social density is positively associated with residents’ behaviour, social abilities, and care outcomes (p 146).

There is similarly strong evidence (Marquardt et al 2014, pp 134 and 146) for small-scale environments having the following effects on people:

- a reduction in behavioural disturbance (there is more agitated behaviour in larger care homes)
- improved social abilities (according to the findings of 12 out of 14 studies) and communication skills
- more engagement in activities
- less drug use than in traditional nursing homes
- decreased blood pressure in people who moved to a smaller care home from a large care home
- greater opportunities for individual care and attention
- improved performance of everyday activities (among people in 9 of 11 studies) and functional status
- maintained or improved cognition (although four studies reported mixed results)
- positive effects on mood and quality of life
- fewer pharmaceutical prescriptions in care homes with low resident–staff ratios.

Calkins and Cassella (2007) found that private rooms were associated with better outcomes, especially psychosocial outcomes, compared to shared rooms, while noting that such rooms were more expensive to build. Private rooms reduce the risk of hospital admission, ‘have positive therapeutic impacts on patients’ (Chaudhury et al 2005, p. 760) and also lead to improved sleep (Morgan and Stewart 1999). Care homes with 30 beds or more were associated with higher incidence of depression (Van Haitsma et al 2004) and worse staff retention rates than small to medium-sized homes (Torrington 2006).



## Colour and contrast

People with dementia have difficulty seeing differences in shades or tones of colour (Brawley 2009; van Hoof et al 2010). Colour contrasts allow people with visual impairment to distinguish edges (Hadjri et al 2012) (eg. it can help to have a toilet seat in a contrasting colour to the toilet bowl and floor, and cutlery/plates a contrasting colour to the table). Conversely, designers can hide doors or exit ways by eliminating colour contrasts. Colour use is also important for personalisation and for way-finding: for example, colours can be used for labelling spaces and rooms (Kelly et al 2011).

The following component is important in terms of colour and contrast that adheres to recognised design principles.

Component	Detail
Dementia care homes use colour and contrast effectively	<ul style="list-style-type: none"><li>• Contrasting colour on toilet seats</li><li>• Contrasting colour on doors that people should engage with</li><li>• Low contrast on spaces people should not engage with</li><li>• Surfaces of different textures</li><li>• Low contrast in transition from one surface to another</li><li>• Contrast between plates and table cloths</li><li>• Colour contrast to demarcate walls and floor</li><li>• Even colours on floors – no patterns</li><li>• Colour to assist with seating</li><li>• Matt surfaces rather than shiny ones</li><li>• Application of the psychology of colour – the way different colours evoke different feelings</li><li>• Purposeful, age-appropriate colour schemes rather than hotel-like neutral schemes</li></ul>

Various publications are available to guide the use of colour and contrast: for example, *The Environmental Audit Tool: High Care* (Fleming and Bennett 2015) and the online version of the same, BEAT-D (see Appendix and University of Wollongong 2012).

## Research rationale

Secure dementia care homes need to use colour, contrast and patterns carefully in order to have a therapeutic effect. Marquardt et al's 2014 systematic review found that:

- high colour contrasts in dining table settings, along with lighting changes, improved eating (Brush et al 2002)
- low colour contrasts and small or no patterns on flooring were helpful for residents' walking performance (Perrit et al 2005); dark lines on the floor or floor patterns could be confusing (Passini et al 2000)
- increased light intensity and improved colour contrast at dining tables produced less disruptive behaviour (Koss and Gilmore 1998)
- soothing surroundings reduced wandering (Algase et al 2010).



# Lighting

Older adults need exposure to natural sunlight to maintain circadian rhythms, vitamin D synthesis and stimulation of serotonin (Brawley 2009). Internal lighting in dementia care homes needs to be a mix of direct and accessible sunlight and adjustable artificial lighting to control glare and shadows and help regulate circadian rhythms (Torrington and Tregenza 2007).

The following component is important in terms of lighting design.

Component	Detail
Secure dementia care homes are designed to maximise natural light and lighting that assists orientation	<ul style="list-style-type: none"><li>• Natural light maximised</li><li>• Shadowing minimised</li><li>• Very high lux levels</li><li>• Standards for lighting</li><li>• Sensors to provide lighting at night</li></ul>

Audit tools such as *The Environmental Audit Tool: High Care* (Fleming and Bennett 2015) and design guides such as *Guidelines for Design and Construction of Residential Health, Care, and Support Facilities* (Facility Guidelines Institute 2014) and Benbow (2014) address specific lighting considerations. Another good resource is the *Light and lighting design for people with dementia* (McNair, Pollock & McGuire, 2011). For example, ambient lighting should be between 320 and 750 lux indoors, with the dining area at the higher end (Benbow 2014). Light sources should have a colour rendering index (CRI) higher than 70 CRI, which fluorescent lighting does not reach (Benbow 2014). Note that many studies discuss ‘light therapy’ as a specific intervention, this is separate to the ambient lighting referred to here.

## Research rationale

Studies of lighting in care homes have found that lighting is rarely adequate for the visual needs of people with dementia (De Lepeleire et al 2007; Topo et al 2012). An Australian study of 30 dementia care homes using *The Environmental Audit Tool: High Care* (Fleming and Bennett 2015) found 50 percent had areas with noteworthy natural light and 33 percent lacked both natural and artificial light. In facilities with lower light levels there was a lack of understanding about the need to use light to offset age-related visual decline (Kelly et al 2011). There are mixed results in the research regarding the impact of lighting on people with dementia. Twenty-one of the 28 studies reviewed by Marquardt et al (2014) investigated light therapy. Marquardt et al noted that:

- five studies found a positive correlation between bright light and negative behaviours; however, light therapy did not affect behaviour in four other studies
- people with dementia exposed to bright light were more awake and verbally competent (Graf et al 2001; Riemersma-van der Lek et al 2008; Nowak and Davis 2011)
- two studies found that light therapy improved mood (Riemersma-van der Lek et al 2008; Nowak and Davis 2011), but three found no relationship between bright light exposure and wellbeing (Lyketsos et al 1999; Ouslander et al 2006; Hickman et al 2007)
- light therapy was associated with improvements in sleep or circadian rhythms (Satlin et al 1992; Mishima et al 1994; van Someren EJW et al 1997; Mishima et al 1998; Lyketsos et al 1999; Ancoli-Israel et al 2003; Sloane et al 2007; van Hoof et al 2009)
- light therapy reduced sleep disturbances (Riemersma-van der Lek et al 2008), but four studies did not find bright light affected sleep (Dowling et al 2005; Dowling et al 2008; van Hoof et al 2009)

- lower lighting conditions were associated with lower wellbeing (Garre-Olmo et al 2012)
- higher overall light levels led to improved cognitive function (Riemersma-van der Lek et al 2008; Graf et al 2001; Nowak and Davis 2011)
- sufficient general lighting and colour contrasts in tableware led to less disruptive behaviour at the dining table (Koss and Gilmore 1998)
- higher luminance level at the dining table and colour contrasts on the table settings meant that people ate more food (Koss and Gilmore 1998; Brush et al 2002); however, another study found improvements in food consumption when lighting was lower (McDaniel et al 2001)
- high light levels caused more wandering (Algase et al 2010).

## Managing environmental stimulation

Fleming investigated two aspects of stimulus control: decrease of distressing stimulation and augmentation of useful stimulation (Fleming et al 2008). Benbow (2014) recommended a layout that separates noisy areas from quiet areas and includes: acoustic ceiling and wall products, double glazing, partitioning, sound reduction in bedrooms, noise reduction adaptations, alarms/paging systems, places for quiet only and soundproofing in bathrooms.

The following component is important in terms of managing environmental stimulation.

Component	Detail
Secure dementia care homes are designed to decrease harmful stimuli and increase helpful stimuli	<ul style="list-style-type: none"> <li>• Noise control:               <ul style="list-style-type: none"> <li>– Overall noise control – curtaining, flooring choice, baffles</li> <li>– Noisy machinery located an appropriate distance from bedrooms</li> <li>– Exploration of alternatives to auditory call bell alert systems</li> <li>– Soundproofing in bedrooms as needed, with moderation for those who need extra monitoring</li> </ul> </li> <li>• Design of space:               <ul style="list-style-type: none"> <li>– Ability to close off areas and separate small groups from large groups</li> <li>– Multi-purpose rooms</li> <li>– Protection of people’s privacy</li> <li>– Design that allows for staff and visitor movement</li> <li>– Space for hosting people’s friends and family</li> <li>– No storage along corridors</li> <li>– Staff utility rooms kept out of the way</li> <li>– Different furniture/décor and the ability to easily change decor</li> <li>– Cultural displays</li> </ul> </li> <li>• Good stimulation:               <ul style="list-style-type: none"> <li>– Reminiscence boards on walls and common spaces</li> <li>– Use of pictures, objects and books that are familiar to the cohort</li> <li>– Technology (eg, Skype)</li> <li>– Pleasant odours (eg, baking)</li> <li>– Music, especially if it can be controlled by people living in the care home (including through headphones).</li> </ul> </li> </ul>

## Research rationale

Research has found the following results for people with dementia and the effect of stimuli exposure:

- five studies found that high levels of noise were associated with increased wandering (worse orientation), aggressive and disruptive behaviour and agitation (Cohen-Mansfield and Werner 1995; Nelson 1995; Joosse 2009; Algase et al 2010; Garcia et al 2012)
- sensory enrichment through visual, auditory, tactile and olfactory stimuli positively affected agitation and wandering frequency (Cohen-Mansfield and Werner 1995); people with dementia may spend more time in enriched environments (Yao and Algase 2006)
- correct room temperature, sounds (eg, birdsong, running water and small animal noises) and pictures reduced agitation in bathrooms (Whall et al 1997; Cohen-Mansfield and Parpura-Gill 2007)
- music used as an intervention reduced agitation (Cohen-Mansfield and Werner 1995; Dunn and Riley-Doucet 2013)
- playing unwanted music or interrupting pleasurable music could increase agitation (Ragneskog et al 1998)
- use of partitions to control sensory stimulation helped attentiveness (Namazi and Johnson 1992b)
- minimising distractions (eliminating televisions and telephones and camouflaging exit doors) led to reduced use of physical restraint and less weight loss (Cleary et al 1988)
- acoustic environment control, especially of mechanical noises and other residents' noises, was key (Wong et al 2014).

There is sufficient evidence to conclude that sensory enhancement through visual, auditory, tactile and olfactory stimuli has a positive effect on agitation behaviours in people with dementia, but stimulation needs careful control (Marquardt et al 2014).

## Memory aides/cues and floor plans

Ecological gerontology investigates the relationship between the physical environment and the wellbeing and behaviour of those with dementia (Marquardt 2011). People with dementia have reduced capabilities to adjust or modify their physical environment; therefore, the environment needs to compensate accordingly through therapeutic design. Therapeutic design to assist memory and way-finding impacts on floor plans and interior finishing such as lighting and colour. Design elements should include fittings and objects that are familiar in size and finish. Utton (2007) gives the examples of cross-head separate hot and cold taps, potted plants and domestic-styled kitchen cupboards. Design elements such as easy-to-navigate floor plans can help reduce decision-making demands for those with cognitive impairment (Marquardt 2011).

The following component is important in terms of memory aides/cues and floor plans.

Component	Detail
Secure dementia care homes are designed to incorporate components to provide memory aides and cues	<ul style="list-style-type: none"><li>• Personalised doors to people's rooms</li><li>• A mix of types of cues, including colours and symbols</li><li>• Cues for activities</li><li>• Cues positioned lower than might seem natural</li><li>• Standardised colours for different sorts of rooms</li></ul>

## Research rationale

Research has found the following results for changes in memory cues and floor plans.

- Architectural design helps people with dementia find their way; for example, a straight circulation system is better than one that features changes in direction, such as L-shapes (Cleary et al 1988; Marquardt 2011).
- A well-stocked kitchen with dining table is a spatial anchor point for orientation (Marquardt 2011).
- Thirteen studies on the impact of environmental cues (such as signposting, labels, direct visual contact, colour, numbers, verbal cues and photographs) on people's function and orientation found positive effects, as follows (Marquardt et al 2014):
  - labels on drawer and cupboard doors and visible objects with confounding items eliminated improved residents' performance of daily living activities (Connell et al 2002; Chard et al 2009)
  - residents' orientation was improved through environmental cues or signposting (Passini et al 2000), especially with both text and icons (Namazi and Johnson 1991b; Scialfa et al 2008)
  - personal cues (eg, written names, photos of people as young adults) positively correlated with people's abilities to locate rooms and belongings (Namazi et al 1991; Nolan et al 2001; Nolan et al 2002; Gross et al 2004)
  - access and use of toilets increased when people with dementia had direct visual access to them (Namazi and Johnson 1991a)
  - the presence of a clock and signs in a dining room orientated people to mealtimes (Nolan and Mathews 2004).
- Eleven studies assessed visual barriers designed to decrease exiting behaviour, and found:
  - the use of camouflage (murals, cloth, patterns and mirrors) reduced exiting behaviour and door testing (Hussian and Brown 1987; Namazi et al 1989; Mayer and Darby 1991; Dickinson et al 1995; Hewawasam 1996; Dickinson and McLain-Kark 1998; Roberts 1999; Kincaid and Peacock 2003; Feliciano et al 2004)
  - the wellbeing of people with dementia was enhanced through the use of inconspicuous safety features (Zeisel et al 2003).

Physical design significantly affects wandering behaviour. Wandering is most common in hallways and dining rooms (during non-meal times). Areas that offer social interaction, and rooms with defined functions (eg, residents' own rooms and day rooms) are more likely to discourage wandering (Torrington, 2006; Algase et al 2010).

## Community links

Strong community and family links are an essential element that supports the creation of dementia-friendly environments, and a major factor in de-institutionalisation within care homes and de-stigmatisation of dementia within the wider community. A dementia-friendly environment 'can be defined as a cohesive system of support that recognises the experiences of the person with dementia and best provides assistance for the person to remain engaged in everyday life in a meaningful way' (Davis et al 2009, p. 187).

The physical environment should be 'inviting to family and friends'; it should make room for them and make them 'feel at home' (Davis et al 2009, p. 192). Maintenance of family stability (family structure and behaviour patterns) and connectedness is important. Davis et al (2009) believe the major barrier to finding ways to make residential care part of the community is only 'a lack of imagination'.

The following component is important in terms links with the community.

Component	Detail
Secure dementia care homes are designed to incorporate links with the community	<ul style="list-style-type: none"><li>• Design of buildings and gardens that welcomes the community in to the space</li><li>• Design that reflects the community of location, to provide a sense of familiarity</li></ul>

## Research rationale

Research about ways to improve community connections included the following concepts.

- Care homes can give people with dementia the opportunity to remain part of organisations or groups, by offering spaces for meetings (Davis et al 2009).
- Through building location and affordances (Topo et al 2012), care homes can assist people to participate in the community. Such participation might involve outings, or invitations for community groups to visit. Also, the orientation and location of care homes can consciously offer people the chance to watch the world go by outside (Utton 2007).
- Garden redesign was found to increase visits from relatives, especially younger relatives, as the garden provided visitors a space within which to spend time outside (Rappe and Topo 2007).

Qualitative data found that people with dementia, and their family carers, liked having a choice of spaces, including both quiet and social spaces. They also liked being able to personalise spaces with familiar and treasured items, and saw a homely feel as important (Innes et al 2011).

# Appendix One: Design audit tools

There are various audit tools for the design of secure dementia care homes internationally. The Australian *Environmental Audit Tool: High Care* (Fleming and Bennett 2015) is the most appropriate for the New Zealand context.

1. *The Environmental Audit Tool: High Care (EAT: HC)* (Fleming and Bennett 2015) is a validated audit tool based on eight design aims:
  - to unobtrusively reduce risks
  - to provide a human scale
  - to allow people to be seen and be seen
  - to manage levels of stimulation
  - to support movement and engagement
  - to create a familiar place
  - to provide opportunities to be alone or with others
  - to support the values and goals of care.

An accompanying Excel spreadsheet assists with scoring. There is also an app version called BEAT-D, which is available on iTunes (Fleming 2011; Fleming et al 2012; Smith et al 2012; University of Wollongong 2012; Fleming et al 2015).

2. *The Sheffield Care Environment Assessment Matrix (SCEAM)* evaluates comfort, safety and health in residential care homes and nursing homes in the United Kingdom, but it is not specific to secure dementia care homes (Popham and Orrell 2012). The tool covers:
  - staff provision and community
  - privacy
  - physical support
  - awareness of the outside world
  - choice and control
  - normalness and authenticity
  - personalisation and cognitive support.
3. *Evaluation of Older People's Living Environments (EVOLVE)* was created out of the University of Sheffield (Lewis et al 2010; Orrell et al 2013). It has a dementia domain built on SCEAM and can be used for a variety of building types, but excludes that which the SCEAM covers.
4. *Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH)* positions dementia residential care as more institutional (Sloane et al 2002; Fleming 2011).

5. *Professional Environmental Assessment Protocol (PEAP)* was developed to supplement the TESS (Lawton et al 2000; Slaughter and Morgan 2012). It has eight dimensions: awareness and orientation, safety and security, privacy, regulation and quality of stimulation, functional abilities, opportunities for personal control, continuity of self and facilitation of social contact.
6. *Dementia Services Development Centre Audit Tool*, published by the University of Stirling in the United Kingdom (Dementia Services Development Centre 2011) scores each room and feature in a dementia residence and rates the extent to which it is dementia-friendly. The tool is also available for purchase through Hammond Care, Australia. The Dementia Services Development Centre also developed the Dementia Design Checklist (Health Facilities Scotland 2007) with Health Facilities Scotland (a division of the NHS Scotland).
7. *Alzheimer's Garden Audit Tool (AGAT)* (Marcus 2007) provides a relatively simple evaluative framework for assessing whether a garden incorporates those design elements and qualities that are necessary for a successful dementia care garden.
8. *The Residential Care Environment Assessment (RCEA)* tool gives specific direction for desirable environmental qualities matched to a design feature's affordances or the potential the features make available in the environment (Topo et al 2012). Aside from the building and layout, the tool assesses the environmental qualities of attached objects, movable objects, mouldable materials, sensual environment and opportunities for socialising and privacy.

# Appendix Two: Workshop attendees

The following individuals participated\* in the initial 2015 workgroup consultation.

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Ginny Brailsford, Pharmacist, Health of Older People,  
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Kate Ashdowne, Manager, Resthaven ARC facility

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Carole Kerr, South Island Alliance Programme Officer

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\* Participation in the workgroups does not constitute agreement with all viewpoints represented in this information resource.

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The following organisations provided feedback on the first draft of this resource.

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Care Association New Zealand

Ministry of Health, Health of Older People's Steering Group

Residential Aged Care Integration Workgroup – Waitemata DHB

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