



# **Dementia Friendly Design Features for Walking Paths A Focused Practice Question**

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*March 2017*

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## Key Messages

1. Design features of walking paths that can support older adults with dementia in safe physical activity, recreation and leisure, and social interaction include: continuous circulation loops with destination points and no dead ends, varying route lengths, and landmarks and memory triggers.
2. Properly positioned signage with text and icons, and effective use of color and contrasts for walking loops can have therapeutic effects and assist with wayfinding.
3. Dementia friendly design features along the outdoor walking path should be an extension of those found in the residential area including: benches, shelters, rest areas, handrails, public washrooms, and motion sensor lighting.
4. Crowded, noisy areas are not appropriate for the location of dementia-friendly walking paths. Paths located in a serene environment with pleasant auditory and sensory cues (e.g., birds, water, vegetation) can provide positive stimulation.
5. Walking paths designed to welcome the entire community into the dementia care space can help de-institutionalize and de-stigmatize dementia in the wider community.

## Issue & Context

Dementia describes a group of symptoms that result from the death of the brain's nerve cells. Symptoms include changes in memory, behaviour, language and ability to reason and think, and are severe enough to interfere with a person's ability to perform activities of daily living. Age is the strongest known non-modifiable risk factor for dementia and is influencing the projected increase in the incidence of the disease. Approximately 564,000 Canadians were living with dementia in 2016, and that number is estimated to increase to 937,000 by 2031<sup>1</sup>. With the proportion of Peel residents aged 65 years and older anticipated to grow from 10.5% in 2011 to 21% by 2041, a corresponding increase in the incidence of dementia in the community can also be expected.

People with dementia and their caregivers face many challenges with day-to-day activities. The impact of dementia on a person's memory, reasoning and language leads to barriers performing activities of daily living and make a person with dementia more vulnerable to the impacts of the built environment. Wayfinding, a process that enables people to orient themselves and navigate from place to place with ease, becomes more challenging with the co-morbidities associated with aging and for those with dementia. Difficulties accessing health services, businesses, and recreation may not only lead to the exacerbation of chronic health co-morbidities but also social isolation. However, communities can be designed in a way to reduce barriers in the built environment and support a person with dementia to enjoy life in a meaningful way.

Two initiatives, age-friendly communities and dementia friendly communities, have globally emerged in response to the population demographic shift. While the two are

recognized as distinct types of initiatives<sup>1</sup>, both aim to create communities that recognize older adults and people with dementia as valued members of the community, and enable them to stay active, independent, and participating in the community for as long as possible by removing barriers and improving design in the built and social environment<sup>2</sup>.

Peel's Regional Council has identified *Promoting Healthy and Age-Friendly Built Environments* as a Term of Council Priority. Age-friendly initiatives alone may overlook some specific needs of people living with dementia, but can offer a means of improving the sustainability and reach of dementia friendly initiatives. Dementia friendly initiatives aim to reduce stigma associated with the disease, and alter the social, attitudinal, architectural, and physical environments to help people with dementia be understood, respected, and supported so they can confidently participate in community life.

This review will provide evidence-informed considerations to support those with dementia engage in safe use of outdoor space, specifically walking paths or wandering loops, and more broadly to advocate for design considerations that are dementia and age-friendly in the community.

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<sup>1</sup> *Age-friendly communities* “encourage active aging by optimizing opportunities for health, participation, and security in order to enhance quality of life as people age. In practical terms, an age-friendly city adapts its structures and services to be accessible to and inclusive of older people with varying needs and capacities.” (World Health Organization, nd). *Dementia friendly communities* “not only seek to preserve the safety and wellbeing of those with dementia, [but] also empower all members to celebrate the capabilities of persons with dementia, and view them as valuable and vital members of the towns, cities, villages and countries in which they reside.” (Alzheimer’s Disease International, nd).

## Literature Review Question

The research question addressed is: What design features help older adults with dementia to engage in safe and purposeful outdoor walking behaviours at residential care facilities?

PICO Question	
<b>Population</b>	Residents with dementia
<b>Intervention</b>	Dementia friendly design features associated with walking loops or wandering
<b>Comparison</b>	n/a
<b>Outcome</b>	Safe and purposeful walking

## Literature Search

In October 2016, a search of the peer-reviewed and grey literature was conducted. Academic literature sources included: MEDLINE, MEDLINE In-Process, Health Star, Global Health, and the Cochrane Database of Systematic Reviews. Grey literatures sources included: the National Institute for Health Care and Excellence (NICE), the Agency for Healthcare Research and Quality (AHQR), Turning Research into Practice (TRIP), and Google. Limits were imposed for articles published in the English language from 2006 to present; no limits were imposed on article or document type. The full search strategy can be found in Appendix A.

## Relevance Assessment

A primary reviewer screened titles and abstracts of all results for primary relevance. Of the articles screened through primary relevance, three reviewers independently reviewed full-text documents for relevance. Discrepancies were addressed through discussion. Studies were assessed based on the following criteria:

- Inclusion criteria: English language; published in the last 10 years (i.e., 2006 to 2016), population of dementia or Alzheimer's patients; addresses public spaces or institutional setting, design features and wandering or walking paths
- Exclusion criteria: duplicates; interventions related to falls or wandering prevention, restraint use; home-based or other non-representative setting.

## **Results of the Search**

The search identified 114 potentially relevant documents in the peer-reviewed literature and 158 potentially relevant documents in the grey literature. Six duplicates were excluded from the search. Based on primary title and abstract review, 22 articles passed the initial relevance assessment and were further assessed for relevancy based on full-text review. Eleven articles were critically appraised. A detailed search results flow chart is presented in Appendix B.

## **Critical Appraisal**

Two reviewers independently assessed the quality of 11 articles using the Health Evidence Quality Assessment Tool for systematic reviews (1), the AACODS Checklist for grey literature (5), the CASP tool for observational studies (3), and a descriptive/cross-sectional study design tool (2). Discrepancies were resolved through discussion and mutual agreement. Results from the assessed studies found three articles were of strong quality, three were moderate quality, and five were weak in quality. Based on the quality assessment scores, only strong articles were included in this report.



## Description of Included Studies

Data extraction for the three studies can be found in Appendix C.

### **Marquardt et al. (2014): Impact of the Design of the Built Environment on People with Dementia: An Evidence-Based Review<sup>3</sup>.**

The objective of this systematic review, rated as strong (8/10 Health Evidence Tool), was to review and rate the available evidence on environments for people with dementia in long-term care facilities using an evidence based approach. There were 169 empirical studies, published from 1980 to 2013, that measured the influence of the physical environment on people with dementia living in long-term care facilities included in the review. Studies included: quasi-experimental studies with low attrition rates, blinding, randomization and consistent results; qualitative studies with a theoretical framework, and observational studies. The level of evidence was classified using an algorithm by two independent reviewers on a rating scale from one (high) to six (low).

### **Government of New Zealand (2016): Secure Dementia Care Home Design<sup>4</sup>.**

The objective of this study, rated as strong (6/6 AACODS Grey Literature Checklist), was to summarize information to support the development, re-design or expansion of secure dementia care homes and enhance the quality of life of those living in them. Sources of information included current research studies (quality and type not described), key informants convened during a 2015 workshop (selection process not described), and existing international design guidelines and standards for secure dementia homes.

**Alzheimer's Foundation of America (2014): Excellence in Design: Optimal Living Space for People with Alzheimer's Disease and Related Dementias<sup>5</sup>.**

This white paper, rated as strong (6/6 AACODS Grey Literature Checklist), summarizes recommendations for the design of care settings to facilitate high-quality, comprehensive, person-centred care for persons with Alzheimer's disease and related dementias. Design recommendations are based on research and experience of Perkin's Eastman design consultants, as well as best practices and guidelines considered relevant by the Alzheimer's Foundation of America. Details of the included research studies, search, and selection processes were not described.

## Synthesis of Findings

Outdoor walking pathways can be designed with a number of features to enrich the quality of life for people with dementia and support them to remain engaged in everyday life in a meaningful way.

**Outdoor walking paths should be designed to provide opportunity for physical activity, recreation and leisure, and social interaction.** Evidence indicates this can be accomplished by:

- Creating continuous circulation loops with destination points and no dead ends. This will limit confusing choices, reduce cognitive demand, and allow for a more enjoyable walk without frustration of figuring out direction<sup>3-5</sup>.
- Varying route lengths to allow those with limited mobility the opportunity for a short walk<sup>4</sup>.
- Integrating direct visual access to relevant landmarks and orienting reference points, to ensure unique character is built into different areas along the pathway. Landmarks for spatial orientation should be distinct and varied (e.g., recognizable objects or specific outdoor features) to assist with wayfinding<sup>3-5</sup>.
- Incorporating design features that serve as memory triggers (e.g., mailbox, bird feeders and bird baths) to provide opportunity for social interaction and environmental engagement<sup>3,4</sup>.

**Walking paths should be visually designed to accommodate reduced capability of memory and wayfinding.** Evidence indicates design features that can assist with memory and wayfinding include:

- Color coding on signs and labels to help communicate information<sup>3,4</sup>.
- Text and icons together on signs will be better understood than icons alone<sup>3</sup>.
- Signs positioned lower than what might seem normal<sup>4</sup>.
- Camouflaged doors, wall murals, and manipulated views will create visual barriers that are successful in reducing unwanted exiting behaviour<sup>3,5</sup>.

**Effective use of color and contrasts for walking loops can have therapeutic effects for a person with dementia and assist with wayfinding.** Evidence indicates that people with dementia have difficulty seeing differences in shades and tones of color. Strategies to effectively use color and contrasts in the design of the walking path include:

- Eliminating color contrasts or creating low color contrasts on spaces people should not engage with (e.g., doors and exits)<sup>3,4</sup>.
- Creating consistent color on paths and avoiding patterns. Patterns and dark lines may be confusing to residents, even causing falls<sup>3,4</sup>.
- Defining texture changes on path edges so that those with poor vision can recognize when they are off the path. Raised edges can pose a tripping hazard and should be avoided<sup>5</sup>.

- Avoiding material that can create a glare (e.g., light concrete) or that can radiate heat (e.g., asphalt)<sup>5</sup>.

**The outdoor walking path should be designed as an extension of the residential space.** A comfortable indoor to outdoor transition can be accomplished by ensuring:

- An even, consistently colored, and glare-free surface transition area from indoors to outdoors<sup>4,5</sup>.
- Options for rest and social interaction by incorporating well-placed benches, sheltered and shaded rest areas along the outdoor walking pathway<sup>4,5</sup>.
- Handrails to assist those with unsteady balance<sup>4,5</sup>.
- A path width that is appropriate for two wheelchairs to pass<sup>5</sup>.
- Accessible public washrooms along the walking loop to reduce the chance of incontinence<sup>5</sup>.
- Motion sensor pathway lighting to assist with nighttime walking and unobtrusively monitoring residents. There are positive associations between bright light exposure and sleep improvements in those with dementia<sup>3-5</sup>.

**Sensory enhancement of the outdoor walking path through visual, auditory, tactile and olfactory stimuli can have a positive effect on mood and behaviour in people with dementia, but needs to be carefully controlled.** Evidence suggests that:

- Pleasant noise can provide positive stimulation by reducing agitation and aggression and increasing social interaction. In contrast, loud noisy environments

and highly variable sounds increase disruptive behaviour and aggression, and reduce social interaction and orientation<sup>3,4</sup>.

- A serene setting is an appropriate location for an outdoor walking pathway. In contrast, crowded and heavily trafficked areas and areas where there is the potential for sudden loud noises (e.g., machinery) are not appropriate places for walking loops to be located<sup>4,5</sup>.

**Strong community connectedness can support dementia friendly outdoor spaces.**

Walking paths can be designed to welcome the entire community into the dementia care space. This linkage can be a major factor in:

- De-institutionalizing and de-stigmatizing dementia in the wider community.
- Enabling the participation of dementia residents in the community through short outings, people watching and social engagement<sup>4</sup>.

## Relevance to Practice

A review of the evidence was undertaken to identify dementia friendly design elements and principles that can be considered in the design of outdoor spaces, specifically outdoor walkways and wandering loops in Peel, to assist those with dementia.

The evidence summarizes various considerations regarding the design, layout, and environmental and sensory cues to assist wayfinding for individuals with dementia; however, there are a number of limitations in the evidence presented which should be acknowledged. First, studies summarized overall conclusions without specific reference to the strength of the supporting evidence. Two documents drew upon key informants, best practices, guidelines, and standards in the synthesis of recommendations; the methods and processes for their selection was not described, and hence their quality cannot be determined<sup>3,4</sup>. Second, not all evidence was specific to 'outdoor wandering loops' but drawn from comprehensive documents on dementia friendly design elements in secure care homes in general; however, design elements are of relevance to the population of interest and generalizable to outdoor space<sup>3-5</sup>.

A well-designed outdoor space, including walking paths that are age-friendly and dementia friendly, can offer opportunities for physical activity, service access, social engagement and a connection to the wider community for older adults. The evidence summarized highlights dementia friendly design considerations that can be considered for new development projects in Peel, for example, the proposed Seniors Health and Wellness Village at Peel Manor, or in other program areas of Peel Public Health to help create healthy and age-friendly communities for the aging population in Peel.

## References

1. Alzheimer Society of Canada. Prevalence and Monetary Costs of Dementia in Canada. Toronto, Ontario: 2016 [cited 2017 January 2]. 70 p. Available from: [http://www.alzheimer.ca/~media/Files/national/Statistics/PrevalenceandCostsofDementia\\_EN.pdf](http://www.alzheimer.ca/~media/Files/national/Statistics/PrevalenceandCostsofDementia_EN.pdf)
2. Turner, N. & Morken, L. Better Together: A Comparative Analysis of Age-Friendly and Dementia Friendly Communities. AARP Affairs International: 2016 [cited 2017 March 1]. 18p. Available from: <http://www.aarp.org/content/dam/aarp/livable-communities/documents-2016/Better-Together-Research-Report.pdf>
3. Marquardt, G., Bueter, K., Motzek, T. (2014). Impact of the Design of the Built Environment on People with Dementia: An Evidence-Based Review. *Health Environments Research & Design Journal*. 8(1), 127-157.
4. Alzheimer's Foundation of America. Excellence in Design: Optimal Living Space for People with Alzheimer's Disease and Related Dementia. New York: 2014 [cited 2017 January 2]. 65 p. Available from: [http://www.alzfdn.org/documents/ExcellenceinDesign\\_Report.pdf](http://www.alzfdn.org/documents/ExcellenceinDesign_Report.pdf)
5. Government of New Zealand Ministry of Health. Secure Dementia Care Home Design Information Resource. Wellington, New Zealand: 2016 [cited 2017 January 2]. 40 p. Available from: <https://www.health.govt.nz/system/files/documents/publications/secure-dementia-care-home-design-information-resource.pdf>



# **Appendices**

**Appendix A: Search Strategy**

**Appendix B: Literature Search Flowchart**

**Appendix C: Data Extraction Tables**

## Appendix A: Search Strategy

### First Library Database Search (October 2016)

Database: EBM Reviews - Cochrane Database of Systematic Reviews <2005 to October 19, 2016>, Global Health <1973 to 2016 Week 41>, Ovid Healthstar <1966 to September 2016>, Ovid MEDLINE(R) <1946 to October Week 2 2016>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <October 20, 2016>

Search Strategy:

- 
- 1 exp Alzheimer Disease/ (142572)
  - 2 "dementia".ti,ab. (147558)
  - 3 exp Dementia/ or exp Frontotemporal Dementia/ or exp AIDS Dementia Complex/ or exp Dementia, Vascular/ or exp Dementia, Multi-Infarct/ (257873)
  - 4 1 or 2 or 3 (299177)
  - 5 exp Confusion/ (19188)
  - 6 exp Orientation/ (37344)
  - 7 exp "Recognition (Psychology)"/ (22767)
  - 8 exp Pattern Recognition, Visual/ (49087)
  - 9 exp Pattern Recognition, Physiological/ (50597)
  - 10 exp Spatial Behavior/ (16401)
  - 11 exp Space Perception/ (78275)
  - 12 5 or 6 or 7 or 8 or 9 or 10 or 11 (183664)
  - 13 exp "Interior Design and Furnishings"/ (8292)
  - 14 exp "Facility Design and Construction"/ (56349)
  - 15 exp Environment Design/ (9294)
  - 16 "environment\*".ti,ab. (1250406)
  - 17 13 or 14 or 15 or 16 (1304607)
  - 18 4 and 12 and 17 (349)
  - 19 limit 18 to (english language and yr="2006 -Current") [Limit not valid in CDSR; records were retained] (163)
  - 20 remove duplicates from 19 (87)

## Second Library Database Search (October 2016)

Database: Ovid MEDLINE(R) <1946 to October Week 3 2016>

Search Strategy:

- 
- 1 exp Alzheimer Disease/ (77870)
  - 2 "dementia".ti,ab. (72699)
  - 3 exp Dementia/ or exp Frontotemporal Dementia/ or exp Dementia, Vascular/ or exp Dementia, Multi-Infarct/ (138126)
  - 4 1 or 2 or 3 (157010)
  - 5 exp Wandering Behavior/ (97)
  - 6 "wander\*".ti. (1273)
  - 7 exp Confusion/ (11213)
  - 8 exp Orientation/ (26496)
  - 9 exp "Recognition (Psychology)"/ (14904)
  - 10 exp Pattern Recognition, Visual/ (32099)
  - 11 exp Pattern Recognition, Physiological/ (33098)
  - 12 exp Spatial Behavior/ (11938)
  - 13 exp Space Perception/ (56031)
  - 14 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (126367)
  - 15 exp Evidence-Based Facility Design/ (4)
  - 16 exp Gardening/ (708)
  - 17 exp "Interior Design and Furnishings"/ (4205)
  - 18 exp "Facility Design and Construction"/ (28868)
  - 19 exp Environment Design/ (4849)
  - 20 "environment\*".ti,ab. (628792)
  - 21 15 or 16 or 17 or 18 or 19 or 20 (657134)
  - 22 4 and 14 and 21 (216)
  - 23 limit 22 to (english language and yr="2006 -Current") (108)

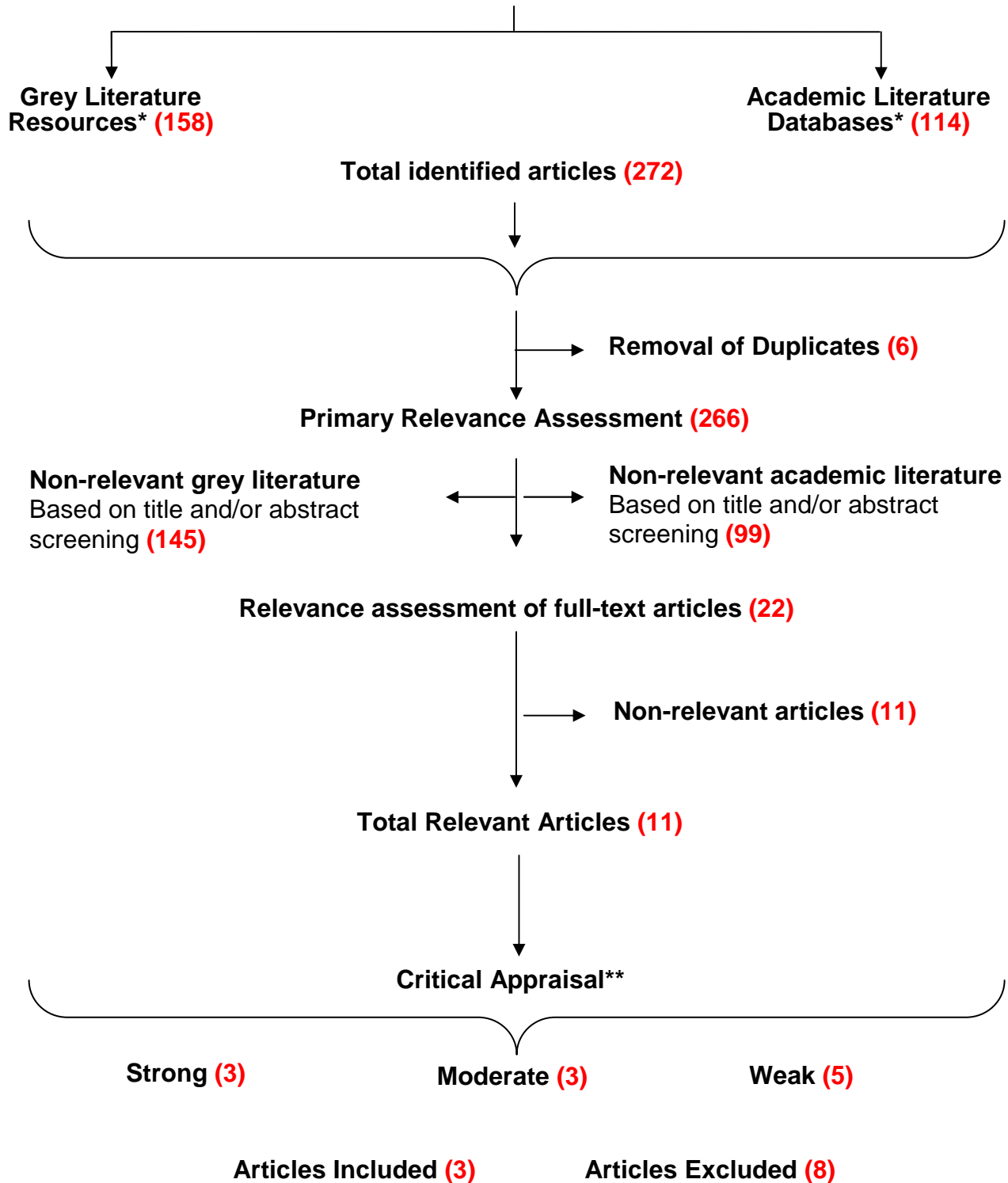
## Grey Literature Search

Search Terms – Alzheimer disease, dementia, walking loop, wandering loop, wayfinding, garden, environment design, age friendly design elements

Databases searched (relevant articles/total results)

NICE (0/6)  
AHRQ (0/54)  
TRIP (1/86)  
Google (12)

## Appendix B: Literature Search Flowchart



## Appendix C: Data Extraction Tables

Criteria	Report 1: Impact of the Design of the Built Environment on People with Dementia: An Evidence-Based Review
Author(s), Date, Country	G. Marquardt, K Bueter, and T Motzek (2014)
Journal or Organization	Health Environments Research & Design Journal, Vol 8, No 1, pp 127-157
Quality Rating	Strong (8/10 Health Evidence Tool)
Objective(s) of Report	To review and rate the available evidence on environments for people with dementia in long-term care facilities using an evidence-based approach to provide: (i) architects and designers with credible evidence to confidently base designs, and (ii) researchers with information on which environmental aspects have been well investigated and where there are gaps.
Types of Studies Included	Empirical studies
Search Period	1980 to February 2013
Databases Searched	MEDLINE, Web of Science, PSYINDEX, PsychINFO, EMBASE, CINAHL, and TOC Premier, and reference lists hand-searched
Inclusion/Exclusion Criteria	Inclusion: Written in English and German Quantitative or Qualitative Measured the influence of the physical environment on people with dementia Study participants of people with dementia, living in a long-term care facility Exclusion: not specifically described
Number of Primary Studies	169 studies included
Study Population	People with dementia living in a long term care facility
Review Methods	Titles and abstracts screened for relevance. Full-text articles were screened for final inclusion by 2 reviewers. Disagreements were discussed with a 3 <sup>rd</sup> reviewer until consensus was reached. Data was extracted on: study objectives, methods, diagnostic criteria, outcomes, interventions, and results in a standard data tracking sheet. An algorithm was created to guide classification of evidence on the basis of level of evidence from 1 (high) to 6 (low). Quasi-experimental studies with low attrition rates, blinding, randomization and consistent results; cohort studies, qualitative studies with a theoretical framework, cross-sectional studies were included in the analysis.
Relevant Results	<b>Building layout</b> was investigated in 6 studies. A negative impact from long corridors on <i>residents behaviour</i> was found in 2

	<p>studies, with resident’s displaying higher restlessness and anxiety or violence. One study found a central location of the nursing station and sightlines between relevant places were influential for prompting or supporting social interactions. Four studies found a relationship with resident’s orientation. All 4 found that direct visual access to relevant places, the integration of reference points, and the implementation of several zones with a unique character were helpful to resident’s wayfinding abilities. Other supportive design features identified: a small number of doors and exit points, spatial proximity to communal spaces, and a straight circulation system support wayfinding.</p> <p><b>Lighting</b> Five out of nine studies found positive correlation between bright light and negative <i>behavioural</i> outcomes such as agitation, restlessness, and aggression; whereas 4 studies found no effect of light therapy. A positive relationship was observed between light therapy on <i>cognition</i> in 3 studies, with residents being more awake, verbally competent with bright light exposure. Positive associations were found between exposure to bright light and improvements in sleep or circadian rhythms in 8 of 13 studies.</p> <p><b>Noise</b> 5 of 7 studies found that high levels of noise were associated with increased wandering and aggressive and disruptive behaviour and agitation. However a pleasant level of noise is suggested beneficial to stimulate residents and help them avoid boredom. Other factors identified include increased social engagement with moderate levels of sound, less social interaction with high noise levels, and worse orientation in noisy environments.</p> <p><b>Sensory Environment</b> in 10 studies, most design guidance states that sensory enhancement of the physical environment through visual, auditory, tactile and olfactory stimuli has a positive effect on mood and behaviour in people with dementia. A soothing atmosphere reduces wandering behaviour and agitation; high variations in sound or a highly engaging environment can result in increased wandering. Colors and patterns have impacts with residents benefitting from informed application of colors, including strong color contrasts; patterns and dark lines may be confusing and even cause falls.</p> <p><b>Environmental Cues</b> 13 studies examined signs, labels and color coding as environmental cues to communicate information to those with dementia. 11 studies found positive effects on resident’s orientation. Wayfinding signs with text and icons are better understood than icons alone among residents with cognitive impairments, specific examples provided. Visual barriers such as camouflaged exit doors, wall murals and manipulated views are successful in reducing exiting behaviours in 10/11 studies.</p>
Relevance to Peel / Summary	Supportive spatial features include a straight circulation system, visual access to relevant places, and integration of meaningful reference points. Bright light therapy has a positive impact on sleep. There is a strong relationship between high noise levels and unwanted behaviour (e.g., wandering, agitation), while pleasant sounds are positively stimulating. Flooring patterns should be avoided, strong color contrasts are beneficial. Signage is effective environmental cue; particularly, when it is personalized; visual barriers are effective in reducing escape attempts.

Criteria	Report 2: Secure Dementia Care Home Design
Author(s), Date, Country	Government of New Zealand (2016)
Journal or Organization	Ministry of Health
Quality Rating	Strong (6/6 AACODS Grey Literature Checklist)
Objective(s) of Report	To support people involved with the development or major reconfiguration or expansion of secure dementia care homes, and to enhance the quality of life of people living in them through a person centred perspective.
Types of Studies Included	Current research studies (not described), key informants, and existing international guidelines
Search Period	Reference list has references back to 1961
Databases Searched	Not described
Guidelines Searched	Dementia in New Zealand: Improving Quality in Residential Care (Lewis, 2002) SNZ HB 8134.5 Health Disability Sector Standards – Proposed Audit Workbook and Guidance for Residential Services for People with Dementia SNZ HB 8134.1 Health and Disability Sector Standard (Residential) Audit Workbook Environmental Assessment Tool: High Care (Fleming and Bennet, 2015)
Key Informants	Participants convened in 2015 to develop guidance for proposed SNZ H 8134.5, discuss barriers to implementation, and facilitating factors, considerations for a person-centred approach to secure dementia home care Workshop participant selection process was not described.
Inclusion/Exclusion Criteria	Not described
Number of Primary Studies	Not applicable
Study Population	People with dementia in secure dementia care homes
Review Methods	Not described
Relevant Results	Well-designed care homes can enrich the quality of life for people with dementia living in secure dementia care homes.  <b>Gardens and outdoor environments</b> Gardens and outdoor spaces have positive impacts on mental and physical wellbeing of people with dementia in care homes by reducing agitation, pacing and exit seeking, violence, the type and frequency of medication use. They also provide opportunity for exercise and recreation, exposure to direct sunlight, improvements in sleep, connections with the wider community, leisure. Outdoor environments need to be designed to be ‘therapeutic’ rather than ‘beautiful’

Designed as an extension of the indoor space:

- visual and physical access between inside and outside
- opportunity for independent physical access from inside to outside
- a transition between indoors and outdoors that is even underfoot
- appropriately surfaced and consistently colored pathways, no glare
- an entrance that is homelike

Provide opportunity for walking:

- a continuous looped path with destination points but no dead ends or confusing choices
- well-placed benches and sheltered rest areas
- a space large enough for meaningful exercise and therapeutic benefit
- motion sensor lighting for night use
- handrails, width appropriate for wheelchairs
- landmarks for spatial orientation

Provide opportunities for social interaction and engagement with the environment:

- raised garden beds, shed, clothesline
- mixed spaces, seating and tables, sunny and shady places, moveable and fixed, space for animals, space for children
- design features that double as memory triggers (mailbox, bird feeders, baths)

Provide sensory stimulation

- 70:30 ratio of green to hard surfaces
- flowers, colors, water, textures
- seasonal variation, shrubs of different heights, scented plants that trigger memories, and vegetable gardens

#### **Color and contrast**

People with dementia have difficulty seeing differences in shades or tones of color; designers can hide doors or exits by eliminating color contrasts. Color is important for personalization and wayfinding. Effective use of color and contrasts in dementia care homes should have a therapeutic effect including:

- low contrasts on spaces people should not engage with
- low contrast in transition from one surface to another; surfaces with different textures
- consistent colors on floors – no patterns
- application of the psychology of color – the way different colours evoke different feelings

#### **Lighting**

Older adults need exposure to natural sunlight to maintain circadian rhythms, vitamin D synthesis, and stimulation of serotonin.



**Environmental stimulation**

There is sufficient evidence to conclude that sensory enhancements through visual, auditory, tactile and olfactory stimuli has a positive effect on agitation behaviours in people with dementia, but stimulation needs to be carefully controlled. Design to decrease harmful stimuli and increase helpful stimuli includes: overall noise control (avoid noisy machinery), pleasant stimulation and sounds.

**Memory aids, cues and floor plans**

People with dementia have reduced capabilities to adjust or modify their physical environment; therefore, the environment needs to compensate accordingly through therapeutic design to assist memory and wayfinding. Examples of cues include personalized doors to resident's rooms; or a mix of colors and symbols, cues for activities, and they should be positioned lower than what might seem normal.

**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-institutionalization within care homes and de-stigmatization of dementia within the wider community.

A dementia friendly environment can be defined as a cohesive system of support that recognizes the experiences of a person with dementia and best provides assistance for the person to remain engaged in everyday life in a meaningful way.

Design to incorporate links with the community include:

- buildings and gardens that welcome the community in the space
- design that reflects the community of location, to provide a sense of familiarity
- participation in the community including outings, people watching

Criteria	Report 3: Excellence in Design: Optimal Living Space for People with Alzheimer’s Disease and Related Dementias
Author(s), Date, Country	E. Chmielewski, Perkins Eastman (2014)
Journal or Organization	Alzheimer’s Foundation of America
Quality Rating	Strong (6/6 AACODS Grey Literature Checklist)
Objective(s) of Report	<p>This White Paper addresses the evolving needs and desires of the growing population with cognitive impairment and their families by presenting recommendations for the design of care settings that would facilitate high quality, comprehensive, person centred care. The specific goals of the report are to:</p> <ul style="list-style-type: none"> <li>(i) present a philosophy of both care and design that will help change the long-term care landscape to meet the needs of all stakeholders – residents, family and professional caregivers, facility management, and communities</li> <li>(ii) reinforce to both designers and care providers the importance of maximizing the remaining strengths of residents with cognitive impairment so that they may live in a dignified, homelike (rather than institutional) environment, and</li> <li>(iii) foster, through raising awareness, the development of a cadre of architects and interior designers interested in specializing in the design of supportive and therapeutic residential settings for people with Alzheimer’s disease.</li> </ul>
Types of Studies Included	Perkins Eastman industry research and experience Details of studies not described
Search Period	References back to 1981
Databases Searched	Not described
Inclusion/Exclusion Criteria	<p><u>Inclusion:</u> Physical environment</p> <p><u>Exclusion:</u> Operational practices</p> <p>The Guidelines are not meant to be a primer for senior living design for Alzheimer’s disease and do not presume to anticipate licensing regulations, building codes, local climate, geography or other variances.</p> <p>Questions, decisions, trade-offs and best practices related to senior living design, Alzheimer’s disease design and universal/accessible design may not be covered by this document.</p>
Number of Primary Studies	Not described
Study Population	Persons with Alzheimer’s Disease and related dementias (frontotemporal, Lewy body, mixed or vascular dementias)
Review Methods	Summary of what Perkins Eastman and the Alzheimer’s Foundation of America consider best practices in design for care settings for people with Alzheimer’s disease. Guidelines/best practices are summarized. Care studies are presented to illustrate how to apply the design guidelines.
Relevant Results	The term Dementia describes “a group of symptoms that result from the death of the brain’s nerve cells, or neurons, including

changes in memory, behaviour, and one's ability to reason and think clearly". Many forms of Alzheimer's disease proceed in stages, gradually affecting memory, communication and language, reasoning, judgment and visual perception. Typically, the disease progresses for an average of 8 to 10 years from diagnosis, ultimately leading to a person's inability to perform activities of daily living, followed by total loss of independence and death.

With advanced age being the greatest known risk factor for Alzheimer's disease, the aging of the baby boom generation is heavily influencing the projected increase in the incidence of the disease. American statistics described.

#### **Wayfinding and Orientation**

- At each decision point, there should be orienting landmarks. Since distinctive cues are more memorable than subtle changes, landmarks should be unique and varied e.g., recognizable objects, artwork, or a specific outdoor feature.
- Circulation routes should be easy to travel, with places to stop and rest.
- Circulation routes should accommodate mobility assistances devices.

#### **Secure Outdoor Spaces**

Providing unrestricted access to secure outdoor spaces, even for residents with elopement issues, is vital since it can reduce agitation and frustration, relieve stress and improve physical fitness (from walking to exposure to sunlight that regulates mood and circadian rhythm). By giving residents a secure place to go outside it can even help reduce elopement attempts since residents do not feel cooped up.

There are several things that can be done to make the outdoor environment safe, more comfortable and even more inviting, providing residents with freedom, independence and autonomy

- Mini-blinds and other coverings on windows and glass doors to screen the view of the outside during poor weather
- Provide views to the outdoors from the interior to help caregivers unobtrusively monitor residents
- Locate outdoor spaces in serene settings (anxiety, disorientation and confusion can occur in complex, crowded or heavily trafficked places or startling or sudden loud noises).
- Perimeter fencing at least 6 feet high, camouflage and fencing with landscape design features such as trees and shrubs; no ladder like elements that could be used for climbing
- Walking paths that are continuous and loop back to building entrances. Multiple cues reduce demand on the user and allow for a more enjoyable walk without frustration of figuring out how to get back.
- If there is a service gate, a solid pathway should not link the gate and the garden's circulation loop
- Path and perimeter lighting both for night time walking and monitoring residents
- Non-toxic plantings that have no sharp edges, abrasive thorns or leaves.
- Direct and universal access from inside the building
- Provision of shade and protection from the cold winds and heat of the sun
- Flat and smooth pathways to reduce risk of falls
- Path edges defined by a change in texture so that someone with poor vision can recognize when they are off the

	<p>path; raised edges should be avoided as they are a tripping hazard</p> <ul style="list-style-type: none"> <li>• Paths wide enough for two wheelchairs to pass</li> <li>• Different route lengths so that people with limited mobility have the option for a short walk</li> <li>• Benches and other seating at entrance points and along the pathways provides an option to rest and promotes social interaction</li> <li>• Handrails for those with unsteady balance</li> <li>• Avoid materials that create glare (e.g. light concrete) or that can radiate heat (e.g., asphalt)</li> </ul> <p><b>Engaged Wandering</b></p> <p>When wandering reflects a person’s desire for mobility, autonomy and/or activity, it should be supported, not discouraged. However, wandering needs to be redirected into safe, engaging and purposeful activities. The environment can be used to help reengage people or redirect purposeless wandering. A well designed walking path in a secure setting offers an opportunity for a person to release excess energy, stay in shape, get sunshine and explore.</p> <ul style="list-style-type: none"> <li>• Provide multiple walking routes, both inside and outside. Several intersecting loops are preferable, including assorted lengths and locations, offering options to people with diverse physical and cognitive abilities</li> <li>• Do not terminate circulation paths in dead ends. Looping paths and destinations can help redirect or engage residents.</li> <li>• Walking loops should allow opportunities for meaningful engagement along the way. The loop should pass next to or through designated activity zones, to allow residents opportunity to join, participate or preview activity.</li> <li>• Provide seating and other places for residents to socialize</li> <li>• Toilets should be easily seen and able to be frequently accessed along the walking loop, for convenience as well as to provide visual connectivity that may reduce the chance of incontinence.</li> <li>• Residents should be able to be unobtrusively monitored along the walking loop.</li> </ul>
Relevance to Peel / Summary	<p>To successfully age in place, the majority of individuals with dementia will need outside support and engagement, provided by community resources or outreach programs. How best can providers research out to these aging adults, support the community of would be residents, diversity their revenue, extend their brands, develop relationships? Partnerships create environments and programs that offer support throughout the continuum of care. Providers and designers can create holistic solutions to support and engage people aging. It is important to also consider the financial benefits that can derive from a well-designed physical environment.</p>