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# Designing for Dementia: A Multiple Case Study Approach to Explore How Care Home Environments May Influence Wandering

Dementia

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## Abstract

Up to 60% of people living with dementia ‘wander’ in care homes. Previously perceived negatively, wandering is increasingly recognised as a meaningful activity, driven by enjoyment, routine, and social connection. Care home environments can support or hinder wandering and orientation, influencing autonomy and wellbeing. This study aimed to describe environmental features that can influence orientation and wandering within care homes. This study developed and employed an evidence-based environmental mapping tool within care homes, recruited to ensure representativeness across ownership, funding, and location. The bespoke tool integrated design criteria from existing literature, such as scale and domesticity and expert experience, addressing orientation and wandering. Visual floor plans were created, and findings were presented in alignment with environmental strategies from a realist review. The 80-item ‘Wayfinding Environmental Mapping Tool for Care Homes’ was developed and used in seven care homes in England (Midlands and the North). Size, layout, and design varied across care homes. Some closely resembled domestic settings, while others had a clinical appearance. Modifiable and non-modifiable features shaped care home environments. In some homes, residents could independently access kitchens, laundry rooms and gardens; whilst others restricted access. Clear signage, natural lighting, and

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visible routes were observed and have the potential to support wandering and orientation. This study applied the novel 'Wayfind Tool', revealing significant heterogeneity in care home environments. We found that modifiable features like personalisation and accessible seating offer cost-effective ways to create supportive, "home-like" settings, aiding orientation and wandering. Given the observed heterogeneity and the crucial environment-behaviour interaction in dementia, future care home research should increasingly integrate environmental mapping methods. Our freely available 'Wayfind Tool' serves descriptive purposes and has potential as an audit instrument to identify areas for improvement, highlighting the environment's role in supporting wandering and orientation.

## Keywords

orientation, environment, care home, independence, design, walking, wandering, environmental mapping

## Introduction

Approximately 70% of care home residents are living with dementia (Thraves, 2016) and an estimated 60% of these individuals will engage in wandering behaviour during their time in the home (Jayasekara, 2009). Given the prevalence of wandering behaviour, and the challenges care home staff face in supporting residents who wander (Mikhaylova-O'Connell et al., 2025) there is an urgent need to better understand how care home environments influence orientation and wandering. Whilst varied terminology and definitions have been used within research, health and social care contexts to describe wandering, it is critical to reflect on our perceptions and comfort with these terms when supporting people living with dementia (Graham, 2017; Mikhaylova-O'Connell et al., 2025).

These terms include 'walking about' (Alzheimer's Society, 2026), 'wayfaring' (Graham, 2017), 'wayfinding' (Marquardt, 2011), or 'walking with purpose' (Care UK, 2025). In the context of dementia, wandering has historically been characterised as frequent walking without intended purpose or direction (Halek & Bartholomeyczik, 2012). Consequently, wandering in dementia has carried negative perceptions of being lost, confused, or attempting to escape, and is associated with perceived risks including potential harm or death (Graham, 2017; Kwak et al., 2015). Historical practices to manage wandering within care homes included physical or human restraints (i.e., chairs or tethers), pharmacological interventions, locked doors and alarms (Price et al., 2000). Such practices were attempted to prevent wandering for residents' protection; however, they are associated with a higher risk of pressure sores, sedation, agitation and violence (Price et al., 2000).

Whilst the term 'wandering' is predominantly used within research literature, within care settings, the term has more recently been reconceptualised as 'walking with purpose' (Care UK, 2025) in recognition of the perceived benefits individuals living with dementia experience from wandering, including socialising, enjoyment, relief from boredom, and as a lifelong habit (Adekoya & Guse, 2019). While risks associated with wandering, such as falls, dehydration, and fatigue are acknowledged, supporting individuals to safely engage in wandering can offer significant physical and mental benefits (Colombo et al., 2001; Dewing, 2011; Graham, 2017; Liddell et al., 2021), therefore, strategies to support wandering should be considered and implemented where possible within care home environments. Within the communal setting of care homes, such strategies must

also consider the multifaceted consequences of wandering behaviours on other residents and staff (Backhouse et al., 2018).

In the United Kingdom (UK), care homes provide 24-h residential care, with or without onsite nursing, for individuals who may be unable to live independently due to multimorbidity, physical and/or cognitive impairments (Gordon et al., 2014). UK care homes display heterogeneity across multiple factors, including ownership, size, scale, funding and availability of nursing support (Dudman et al., 2018). The physical environment of care homes varies greatly, which can influence residents' behaviour and experiences (Milke et al., 2009). According to the ecological model of ageing by Lawton and Nahemow (1973), an individual's function is shaped by the interaction between biological, psychological and social resources and the surrounding environment, with particular emphasis on the degree of fit between the person and their environment. Furthermore, the Environmental Docility Hypothesis (Lawton & Simon, 1968) highlights that individuals with cognitive and/or physical impairment have greater dependence on their environment, as they are less able to adapt to meet environmental demands. As care home residents spend the majority of the day in their care home, with little or no opportunity to leave this environment, it both determines whether there is adequate space to walk, and shapes whether residents are able to wander safely and meaningfully. Creating a supportive care environment can therefore reduce the risks associated with wandering, without preventing this meaningful activity (Gu, 2015).

A recent realist review exploring strategies to support safe wandering highlighted several environmental factors that support and encourage safe wandering and orientation (Hock et al., 2025). The review generated five programme theories (person-centred care, access to areas, hydration and nutrition, monitoring, and navigation), each comprising context, mechanisms, and outcomes, and outlined how strategies were effective, in what situations, and for whom. Additional research studies have identified specific design elements that can aid orientation and wandering, including clear signage, floor finishing, contrasting colours, points of interest, recognisable landmarks, and minimal decision-making for choice of direction (Alam & Kim, 2023; Giffiths et al., 2024; Shabha et al., 2022; Van Buuren & Mohammadi, 2022; Yao & Algase, 2008). These visual elements are particularly important due to the prevalence of visual impairments in older adults living with dementia (Zhang et al., 2023b) and the overall sensory visual deficit observed in Alzheimer's disease (Zhang et al., 2023a). Specific functions such as visuospatial awareness (Pal et al., 2016) and visual contrast sensitivity (Risacher et al., 2013) have been shown to be impaired in older adults living with dementia and therefore potentially impact their ability to navigate their environment safely.

Other environmental features have been shown to support care home residents to physically mobilise, including the presence of accessible walking loops, handrails, and non-slip flooring. Contrastingly, blocked paths or cluttered corridors may create agitation and increase the risk of falls (Faith, 2014; Mazzei et al., 2013). Access to secure outdoor areas can provide valuable opportunities for stimulation and exercise (Faith, 2014; Giffiths et al., 2024; McQuilkin, 2016), yet is often restricted due to safety concerns. Layouts that enable staff monitoring from a distance can enhance safety without infringing on autonomy (Alam & Kim, 2023; Faith, 2014; McQuilkin, 2016). In addition to physical environmental features, sufficient care home staffing levels can enable person-centred care delivery (Van Buuren & Mohammadi, 2022).

Dementia care must be individualised and person-centred (Kitwood, 1997) to promote quality of life and function. The therapeutic potential of resources external to the individual living with dementia must be optimised, including the built environment (Calkins et al., 2022). However, initial models of person-centred care in dementia (Kitwood, 1997) did not acknowledge the influence of the physical environment within their care principles. With rising numbers of people living with

dementia in care homes (Dudman et al., 2018) and increasing emphasis on creating dementia-friendly environments, there is an urgent need to develop an in-depth understanding of how the physical environment of care homes can support orientation and wandering.

Growing recognition that the physical environment profoundly impacts individuals living with dementia (Ludden et al., 2019) has driven the development and evolution of environmental assessment tools in recent decades, to evaluate, assess and/or audit environmental features of dementia care settings. Initially, environmental assessment tools emerged as dementia care pivoted from biomedical approaches (Katzman, 1976) towards increasingly holistic and individualised care. Previous tools, developed across different countries, have been designed to capture environmental features of dementia care settings, without focusing on specific environment-behaviour relationships. A recent systematic review of 13 assessment tools related to environments for people living with dementia (Calkins et al., 2022) highlighted the need for a clearer hypothesised link between environmental characteristics and behaviour in people living with dementia. Accordingly, this study aims to describe indoor and outdoor environmental features of care homes that influence wandering and orientation, using the first mapping tool developed specifically for this purpose.

## Aim and Objectives

Within a larger project, including a realist review and an ethnographic study, exploring how care home staff support residents to wander safely, this study aimed to provide detailed descriptions of both indoor and outdoor environmental features that influence orientation and wandering behaviours across seven care homes. This work will help to inform future research on the influence of care home environments. The objectives were to:

1. Develop a comprehensive environmental mapping tool for care homes, tailored to include features that influence orientation and wandering behaviours, informed by research literature and clinical experience.
2. Conduct environmental mapping of seven purpose-built and non-purpose-built dementia care homes in England (Midlands and the North).
3. Describe the environmental features of seven purpose-built and non-purpose-built dementia care homes in England (Midlands and the North).

## Methods

### *Study Setting and Participants*

Care homes in England (Midlands and the North) were recruited as part of a larger research project exploring wandering in care homes, via professional networks and advertising via local National Institute for Health and Care Research (NIHR) 'Enabling Research in Care Homes' (ENRICH) networks. When recruiting care homes, consideration was taken to ensure a representative sample. Factors considered included funding type, ownership, Index of Multiple Deprivation (IMD) and geographical location.

### *'The Wayfinding Environmental Mapping Tool for Care Homes' Development*

The Wayfinding Environmental Mapping Tool for Care Homes, hereby termed 'The Wayfind Tool', was developed by an Occupational Therapist with experience of working with individuals

living with dementia in care home settings and ratified by the research team. Firstly, draft items were derived from a prior study that identified design criteria that stimulate wayfinding for older adults living with dementia (Van Buuren & Mohammadi, 2022), established guidelines on dementia-friendly health and social care environments (Department of Health and Social Care, 2021), and a systematic review of environmental design for people living with dementia (Bowes & Dawson, 2019). Secondly, additional qualitative aspects of care home environments (i.e., scale and domesticity) deemed supportive for spatial orientation and wayfinding in dementia were identified from recent qualitative research with care home staff (Giffiths et al., 2024) and used to form additional draft items. Thirdly, draft items were organised and divided across distinct rooms or areas within each care home (i.e., entrance, living room, corridor) to allow for different areas to be described, consistent with prior Occupational Therapy environmental screening tools (Mackenzie et al., 2000). Finally, the draft tool was reviewed and ratified by the research team via multiple rounds of written and verbal feedback.

Environmental Mapping

Environmental mapping was conducted by an Occupational Therapist (the lead author) and member(s) of the research team using The Wayfind Tool. Where care homes had multiple units or floors, environmental mapping was completed for a single shared space (i.e., living and dining area) most frequently used by care home residents participating in the ethnographic study. A recent realist review (Hock et al., 2025) identified a range of environmental strategies that can support orientation and wandering (Figure 1). Environmental mapping findings were aligned with these environmental strategies for consistency. For the full environmental mapping data extraction form, please see Supplemental Material 1.

Typological Floor Plans

Typological floor plans for each care home were created by the research team using fire plans. These plans provide an overview of the essential features of each home and allow for a classification of care homes based on their similarities and differences. Plans were created for the floor, wing, or area within a care home that underwent detailed environmental mapping.

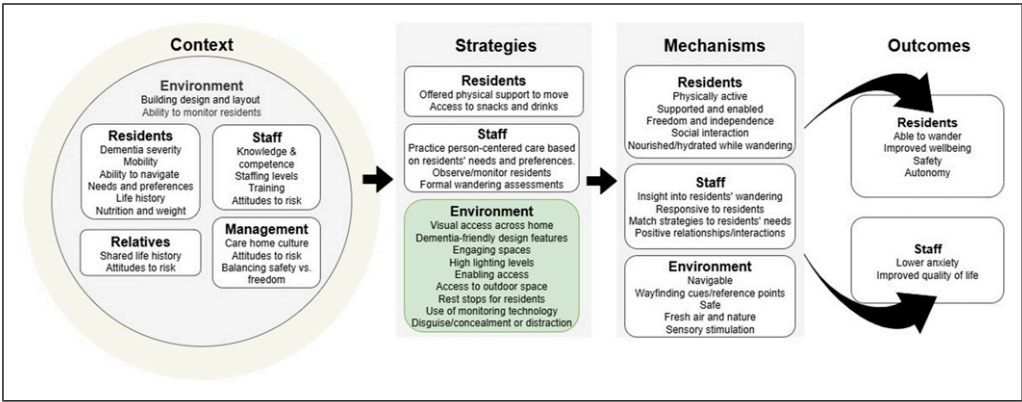


Figure 1. Environmental strategies from prior realist review (amended from Hock et al., 2025)

## *Ethical Considerations*

Ethical approval for this study was obtained from the Camberwell St Giles NHS Ethics Committee (24/LO/0659) on the 11th November 2024. Organisational representatives provided signed agreements for each care home to participate. To preserve anonymity, each care home was assigned a pseudonym. Additionally, identifiable characteristics have been omitted from results.

## **Results**

### *The Wayfind Tool*

Following ratification via verbal and written feedback from the research team, a final selection of 80 items pertinent to the environmental features of care homes that influence orientation and wandering were selected ([Table 1](#)). The 80 items covered 11 environmental categories within each care home (care home exit, fire safety, living room, visual access, corridor, individual room [i.e., bedroom], toilet, kitchen, dining area, outdoor space and general care home features). Within every category, data across multiple items were gathered, from qualitative descriptions of features (e.g., points of interest), to quantitative measurements (e.g., width of corridor).

### *Care Homes*

Seven care homes ([Table 2](#)) were recruited across four English counties in the North and the Midlands (covering an area of 496.66 square miles). The care homes were built between the 1960s (Daffodil) and 2020s (Bluebell) and consisted of homes owned by large and medium organisations and independently run care homes. The IMD ranks ranged from 350, representing the top 1% of the most deprived areas in England, to 23,345, representing the top 10% least deprived areas in England.

### *Environmental Mapping Using the Wayfind Tool*

Full environmental mapping data are listed in [Supplemental Materials](#). The environmental features of seven care homes were mapped using the bespoke 80-item Wayfind Tool ([Table 1](#)) between January and May 2025 by an Occupational Therapist and members of the research team. Environmental mapping findings were presented in alignment with environmental strategies identified in a prior realist review ([Hock et al., 2025](#)). Typological floor plans are presented in [Figure 2](#).

### *Dementia-Friendly Design Features*

Anemone, Bluebell and Crocus were purpose-built facilities for individuals living with dementia. All other care homes were non-purpose-built environments, with or without renovations ([Table 2](#)). Anemone and Edelweiss represent care homes with residents living with dementia only, whilst all other care homes represent environments with mixed residents, including people living with dementia. Environmental mapping revealed that all care homes contained a blend of domestic, clinical, and commercial design features, regardless of whether they were purpose-built or renovated. For example, while one care home (Crocus) was distinguished by a high degree of domesticity (resembling a private home), others featured spaces reminiscent of clinical (Foxglove and Geranium) or commercial (Anemone and Bluebell) environments, similar to hospitals or hotels.

**Table 1.** The Wayfind Tool Environmental Categories

| The Wayfind tool environmental categories                                                                                                                                                                                                                                                                                                                                              | 1. General                                                                                                                                                                                                                                                                                                                                               | 2. Exit/foyer                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• Total care home capacity</li> <li>• Decade care home was built</li> <li>• Purpose built</li> <li>• Scale/domesticity</li> <li>• Current number of residents</li> <li>• Number of 'wings'/'floors'</li> <li>• Number of residents per unit</li> <li>• Number of floors</li> </ul>                                | <ul style="list-style-type: none"> <li>• Location of exit door/s</li> <li>• Foyer features</li> <li>• Accessibility of stairs/lifts</li> <li>• Restrictive access to exit</li> </ul>                                                                                                 |
| 3. Fire safety                                                                                                                                                                                                                                                                                                                                                                         | 4. Living room                                                                                                                                                                                                                                                                                                                                           | 5. Visual access to route                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Fire exit location</li> <li>• Fire exit concealment</li> <li>• If concealed, is this still safe for use</li> </ul>                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Location</li> <li>• Flooring</li> <li>• Points of interest</li> <li>• Number of doors</li> <li>• Layout of seating</li> <li>• Type of seating</li> <li>• Height of seating</li> <li>• Armrests of seating</li> <li>• Type of table</li> <li>• Height of table</li> </ul> | <ul style="list-style-type: none"> <li>• Entrance to living room</li> <li>• Living room to corridor</li> <li>• Living areas to individual rooms</li> <li>• Orientation to the outdoors</li> <li>• Individual room to toilet</li> </ul>                                               |
| 6. Corridor                                                                                                                                                                                                                                                                                                                                                                            | 7. Individual room                                                                                                                                                                                                                                                                                                                                       | 8. Toilet                                                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Circulation system</li> <li>• Moments of decision</li> <li>• Length</li> <li>• Width</li> <li>• Flooring</li> <li>• Shape</li> <li>• Signage</li> <li>• Lighting</li> <li>• Seating</li> <li>• Grab rails/bannister</li> <li>• Number of doors</li> <li>• Points of interest</li> <li>• Areas of interest</li> <li>• Natural light</li> </ul> | <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Lighting</li> <li>• Points of interest</li> <li>• Flooring</li> </ul>                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Lighting</li> <li>• Flooring</li> </ul>                                                                                                                                                              |
| 9. Kitchen                                                                                                                                                                                                                                                                                                                                                                             | 10. Dining area                                                                                                                                                                                                                                                                                                                                          | 11. Outdoor space                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Lighting</li> <li>• Flooring</li> <li>• Independent access to kitchen</li> <li>• Independent access to food/drink</li> </ul>                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Points of interest</li> <li>• Lighting</li> <li>• Flooring</li> <li>• Type of seating</li> <li>• Height of seating</li> <li>• Armrests of seating</li> <li>• Type of table</li> <li>• Height of table</li> </ul>                                                         | <ul style="list-style-type: none"> <li>• Entrance</li> <li>• Signage</li> <li>• Restricted access</li> <li>• Quality of surface</li> <li>• Availability of seating</li> <li>• Layout</li> <li>• Safety of plants</li> <li>• Areas of interest</li> <li>• Continuous paths</li> </ul> |



**Table 2.** Care Homes Characteristics

| Name, decade built          | Purpose-built dementia care home (with renovations) | Location <sup>a</sup> | Index of multiple deprivation rank (IMD) <sup>b</sup> | Organisation size <sup>c</sup> (no. of care homes) | Max no. of residents | Length of longest corridor (nearest metre) <sup>d</sup> | Corridor configuration <sup>e</sup> | Corridor width (nearest millimetre) |
|-----------------------------|-----------------------------------------------------|-----------------------|-------------------------------------------------------|----------------------------------------------------|----------------------|---------------------------------------------------------|-------------------------------------|-------------------------------------|
| Anenome, 2000 <sup>f</sup>  | Y (Y)                                               | Urban                 | 350                                                   | Medium (28)                                        | 20                   | 67                                                      | 4                                   | 1480                                |
| Bluebell, 2020              | Y (N)                                               | Urban                 | 21,493                                                | Small (7)                                          | 60                   | 58                                                      | 2 & 5                               | 1400                                |
| Crocus, 1980                | Y (Y)                                               | Rural                 | 10,709                                                | Single (1)                                         | 54                   | 28                                                      | 2                                   | 1170                                |
| Daffodil, 1960              | N (N)                                               | Urban                 | 4,085                                                 | Large (67)                                         | 43                   | 33                                                      | 2 & 4                               | 1194                                |
| Edelweiss, 1990             | N (Y)                                               | Urban                 | 22,784                                                | Small (2)                                          | 40                   | 24                                                      | 2 & 4                               | 1210                                |
| Foxglove, 1980              | N (N)                                               | Urban                 | 22,784                                                | Small (2)                                          | 28                   | 24                                                      | 2                                   | 1180                                |
| Geranium, 1980 <sup>f</sup> | N (Y)                                               | Urban                 | 23,345                                                | Single (1)                                         | 88                   | 39                                                      | 2 & 4                               | 1370                                |

<sup>a</sup>Locations of care homes were self-reported as either 'Urban' or 'Rural' by care home managers during recruitment.

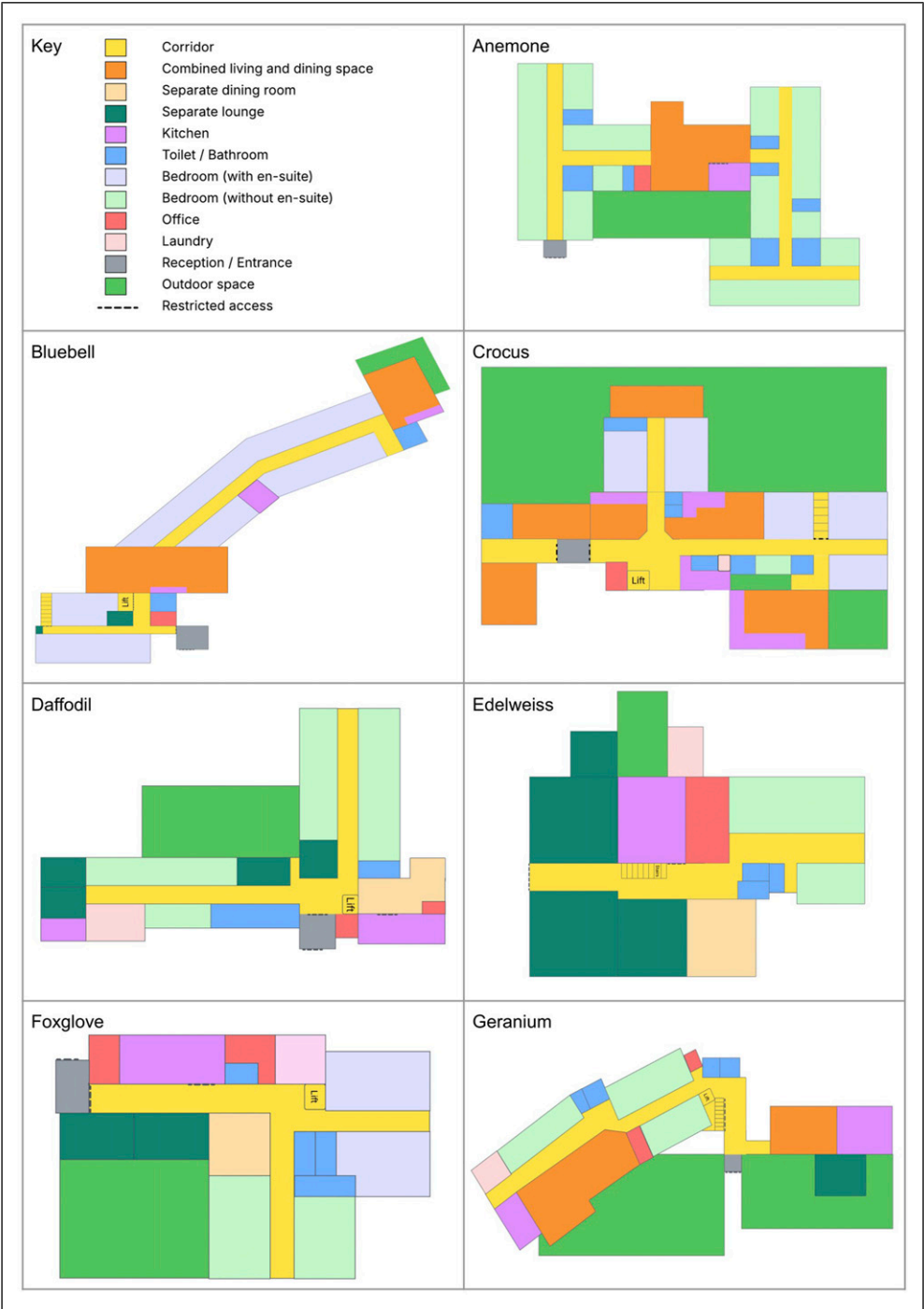
<sup>b</sup>Based on English Indices of Deprivation 2019). IMD is calculated by postcode and ranges from 1 (most deprived) to 32,855 (least deprived) based on seven domains of deprivation: Income, Employment, Health Deprivation and Disability, Education, Skills and Training, Crime, Barriers to Housing and Services, and Living Environment.

<sup>c</sup>Organisation size according to definition included within [LaingBuisson \(2025\)](#). Single (1), Small (2-4), Medium (5-49), Large (50+).

<sup>d</sup>The longest corridor, or route from an individual room to the living room entrance, within a single floor, was assessed for all listed features. This method aims to replicate the longest journey an individual could take to navigate within their care home.

<sup>e</sup>Refers to circulation system within corridors systemised by [Van Buuren and Mohammadi \(2022\)](#) (1) Linear, (2) Linear with one or more corridors, (3) Circular, (4) Two corridors, (5) Corridor blends to living room.

<sup>f</sup>Representing a distinct unit within a care home, as opposed to an entire care home.



**Figure 2.** Typological floor plans for the seven participating care homes

Specifically, clinical features—including automated lighting, handrails, emergency cords, and bath lifts—were consistently observed in the toilets and bathrooms of all care homes. In contrast, commercial elements were most evident in long corridors that also lacked personalisation or points of interest. This was evident in Bluebell, which featured impersonal artwork at set intervals along the length of its corridors.

### *Visual Access Across Care Homes*

Visual access from the entrance of care homes to the living room was present in four of the seven care homes; only Edelweiss and Foxglove provided accessible signage to their living room (i.e., large font, contrasting text colour and supplemented with an image). Visual access from the living room to the corridor was present in three care homes (Anemone, Bluebell and Geranium), whereas in the remaining four, it was otherwise concealed by the shape and form of the living room entry doors. Notably, only Geranium provided signage for corridors, such as ‘XX Family’, to provide guidance towards different wings of the care home. Residents’ rooms were divided across different ‘Families’, and hence the presence of this signage aimed to support spatial orientation towards their own room.

For all care homes, visual access from the living room to individual rooms (i.e., residents’ bedrooms) was unavailable. Accessible signage for bedrooms was available in all care homes with the exception of Foxglove, whose bedroom doors were distinguished by different colours and designed to resemble the external front door of a house with door numbers. Visual accessibility of toilets to individual rooms varied within and between care homes; for example, Edelweiss, Foxglove and Geranium comprised both en-suite and non-en-suite bedrooms. For rooms without an en-suite, visual access to toilets was unavailable. Daffodil was the only care home without any en-suite facilities and no visual access from individual rooms to doorways of shared toilets and bathrooms. All toilets and bathrooms across all care homes provided accessible signage on the door (i.e., large font, contrasting text colour and supplemented with an image). Visual access to the outdoors and exposure to natural light was provided in all care homes through a combination of doors and windows.

### *Engaging Spaces*

Across all care homes, living rooms, corridors, individual rooms and dining areas contained ‘points of interest’. These ranged from artwork, games, sensory items, photos, clocks, orientation boards (i.e., visual display of date, month, year, location, etc.), to books and ornaments. Across all care homes, individual rooms generally provided the greatest opportunities for ‘domesticity’ and personalisation, with the integration of personal items, such as photos, furniture, and chosen soft furnishings, including curtains, blankets and pillows. In some care homes, residents could independently access areas like kitchens (Crocus and Geranium) and laundry rooms (Crocus), supporting residents to engage in home-making activities.

Residents could also independently access the garden in some care homes (Crocus, Daffodil, Edelweiss and Geranium). Notably, Anemone was the only care home to lack ‘points of interest’ for residents within their outdoor space. In all other care homes, additional points of interest were available in outdoor spaces, including orientation of seating to observe nature, bird feeders, raised flower beds, vegetable gardens and water features. Crocus provided an extensive array of outdoor activities and environments to promote exploration and reminiscence, including a memorial garden and paths with points of interest.

## Lighting Levels

All care homes provided artificial lighting at regular intervals along the length of corridors. Corridor lights were predominantly on at all times in care homes (i.e., non-automatic), however, in Bluebell and Foxglove, lights were dimmed at night. Individual rooms across all care homes were lit by both natural light and artificial, non-automatic ceiling lights. Toilet and bathroom lighting varied within and between care homes. Few bathrooms or toilets had adequate natural lighting; therefore, non-automatic artificial lighting was on most of the time. Anemone, Bluebell, Crocus and Daffodil also had automatic artificial lighting in toilets and bathrooms. Dining areas across all care homes typically had access to greater natural lighting through windows or glass doors, providing additional opportunities for temporal orientation, in addition to non-automatic artificial lighting.

## Enabling Access

Access within care homes was enabled by the texture, level, colour and reflectivity of flooring amongst other factors, including thresholds, the features of room entrances and availability of handrails. Flooring in all corridors was dark-coloured and either carpet (Crocus and Daffodil) or wood effect (Anemone, Bluebell, Edelweiss and Foxglove) or a mix of both (Geranium). Corridor flooring in Foxglove was mildly reflective. For wood effect flooring, floor board patterns ranged from straight-lay (Anemone) to horizontal (Bluebell) and diagonal patterns (Edelweiss and Foxglove). Crocus was the only care home without an available grab rail or bannister on the main corridor from the living room to individual rooms.

The entrances to all individual rooms from corridors across care homes were level (i.e., no threshold step to access); nevertheless, flooring within individual rooms sometimes differed in texture and colour from the corridor, providing a visual threshold or contrast (Daffodil and Geranium). In others (Bluebell, Crocus, Edelweiss and Foxglove) flooring was consistent with the corridor, or separated from the corridor by a flush silver rim (Anemone). Similarly, throughout all homes, the entrances to toilets and bathrooms were level without a threshold step to access. Toilet and bathroom flooring comprised matt blue or pink textured lino throughout all care homes, which contrasted with the flooring colour in corridors. Entrances to toilets and bathrooms, therefore, consistently provided a visual threshold or contrast for residents on entry.

Environmental features of main kitchens were mapped despite representing inaccessible spaces (i.e., restricted via pin codes) for residents in five of the seven care homes (Anemone, Bluebell, Daffodil, Edelweiss and Foxglove). In contrast, Crocus and Geranium provided supervised access to kitchens, situated within open-plan areas adjoining their respective dining rooms. This design allowed for cooking scents to permeate other living areas, replicating a more 'domestic' environment. Consistent across all care homes, dining room entrances featured a level threshold, reducing trip hazards and visual thresholds and facilitating movement. As with individual rooms, in Anemone, this threshold was defined by a flush silver rim. A matte finish was uniformly observed across all care homes' dining room floors, contributing to a less reflective and potentially safer surface. Despite these similarities, notable variations in dining room configuration and flooring material were observed. Four care homes (Anemone, Bluebell, Crocus, and Geranium) featured open-plan dining areas, connected to other communal spaces, such as living rooms or kitchenettes. Conversely, Daffodil, Edelweiss and Foxglove had separate dining rooms; in addition, access to Foxglove's dining room was locked between meals. Regarding flooring, the specific material and pattern varied. While the majority of homes (Anemone, Bluebell, Crocus, Daffodil, and Geranium) used wood-effect flooring, the pattern differed between them (e.g., chevron versus straight-lay).

The remaining two homes used tiles: Edelweiss had terracotta tiles with a non-uniform colour fade, whereas Foxglove used uniform-coloured matte tiles.

### *Access to Outdoor Space*

All care homes provided outdoor spaces, however, access varied from open (Crocus, Daffodil, Edelweiss and Geranium) to restricted (Anemone, Bluebell and Foxglove) via locked doors or pin codes. While all entrances to outdoor spaces aimed for wheelchair accessibility, a small threshold lip (1-2 inches in height) was present in Bluebell and Edelweiss, a potential trip hazard. The continuity of pathways was a key difference among outdoor spaces. Continuous pathways surrounding the perimeter of gardens were present in Crocus, Daffodil and Geranium, thus promoting continuous walking. In contrast, in the remaining four homes, linear pathways were present. Across all care homes, the quality of surfaces in outdoor spaces was accessible to those using wheelchairs or walking aids. All homes used a form of paving or decking. Ramps or slopes were shallow, and steps were accompanied by rails on one side (Edelweiss) or both sides (Foxglove). A final consistent finding across all care homes' outdoor spaces was the absence of signage to provide spatial orientation towards any of the outdoor spaces or to return indoors.

### *Rest Stops for Residents*

Rest stops for residents were available to varying degrees as seating within living rooms, corridors, dining areas and outdoor spaces. Within living rooms, care homes utilised differing seating configurations, the most common being a single circle or semi-circle to facilitate social interaction, observed in six care homes (Anemone, Bluebell, Crocus, Edelweiss, Foxglove and Geranium). Daffodil had a more unique arrangement of four smaller semi-circles in each quarter of the rectangular living room. All seating ranged from 17-21.5" seat height with bilateral armrests to support transfers and repositioning. Rest stops within corridors were present in only two care homes (Bluebell and Geranium). Within dining areas, seating (and hence rest stops) consistently comprised padded dining chairs, 18-19" in seat height, with bilateral armchairs across all care homes.

Within outdoor spaces, a variety of seating types were observed, providing the opportunity for rest breaks. Wooden benches (Crocus, Edelweiss and Geranium) and wooden picnic benches (Bluebell and Crocus) were available, as well as individual chairs of differing materials, including wood (Daffodil, Edelweiss), metal (Anemone), rattan and plastic (Geranium). Seating was typically distributed throughout gardens, along the edge of buildings or within designated seating areas. With the exception of Anemone's small metal chairs, all other outdoor seating had bilateral armrests to support safe and independent transfers.

### *Concealment or Distraction*

Care homes relied on coded or physically restricted access to lifts, stairs and exits to ensure resident safety. Lifts were accessible to residents in all care homes except Foxglove, which restricted lift access via a code. Stair access was restricted in all care homes through a combination of pin codes (Bluebell, Crocus, Daffodil, Edelweiss, Foxglove and Geranium) and stair gates (Crocus, Foxglove, Geranium), however, lifts and stairwells were not overtly concealed. Anemone comprised a single-level facility, without lifts or stairs. Access to external exits was consistently restricted across all seven homes. Every care home utilised access codes to manage exits, which lacked signage but were not concealed. Notably, some residents within Daffodil and Edelweiss were risk-assessed to

gain independent access to the exit code to access the local community. Fire exits were not concealed in any of the care homes, ensuring clear visibility for emergency use.

## Discussion

This paper presents the development and application of the evidence-based Wayfind Tool, designed to describe environmental features relevant to orientation and wandering among care home residents living with dementia. The study's objectives were to create a comprehensive environmental mapping tool and apply it across seven purpose-built and non-purpose-built dementia care homes in England to systematically describe features influencing orientation and wandering. To the author's knowledge, this represents the first environmental mapping tool developed for the purpose of capturing features of care homes pertinent to wandering and orientation, and hence constitutes novel and clinically meaningful research. The comprehensive tool comprises 80 items, categorised across 11 environmental categories. It is intended for descriptive purposes, facilitating a deeper understanding of the environments in which residents living with dementia orientate and engage in wandering behaviours.

For this study, the Wayfind Tool was used to map seven care homes situated across four English counties in the North and the Midlands. The IMD ranks for these locations ranged from 350 to 23,345, representing areas with both very high and very low levels of deprivation, respectively. The sampled care homes, constructed between the 1960s and 2020s, included 43% purpose-built facilities. Whilst the built environment of care homes may be non-modifiable, modifiable features of the environment have the potential to support wandering and orientation, which are particularly important for non-purpose-built settings. Points of interest, personalisation, appropriate signage, lighting, and availability of seating are examples of modifiable features that can support individuals living with dementia in wandering within care home settings (Hock et al., 2025). Such considerations have the potential to be simple, cost-effective and minimally invasive alterations to care homes to better support residents who wander.

The current study highlights the heterogeneity of features of care home environments, evident both between and within individual care homes. The mapping methods employed in this study yielded rich environmental descriptions and facilitated systematic recording of features pertinent to orientation and wandering. The observed variation in size, scale and domesticity of these environments underscores that homogeneity of care home environments cannot be assumed. Accordingly, future studies investigating behaviours or phenomena influenced by the environment should incorporate detailed environmental descriptions and/or mapping methods to enhance contextual understanding and clinical utility. The Wayfind Tool is freely available via the authors to support future care home research.

Although utilised here for descriptive purposes, the Wayfind Tool also holds broader applicability. It has potential as an audit instrument to identify areas for environmental improvement within care homes, thereby enhancing support for residents living with dementia who exhibit wandering behaviours. The division of the tool into 11 environmental categories allows individual domains to be applied in isolation to address specific research questions (e.g., environmental mapping for kitchen and dining environments in studies of mealtime behaviours). Moreover, the tool may be transferable to other settings that share similar spatial and organisational characteristics to care homes, such as hospital wards with communal and private areas or extra care housing facilities. This adaptability suggests potential for wider generalisability beyond the care home context.

Within the current study, environmental mapping revealed that all care homes contained a blend of domestic (i.e., home-like), clinical (i.e., hospital-like), and commercial (i.e., hotel-like) design features, regardless of whether they were purpose-built, non-purpose-built, or renovated. Notably, clinical features consistently characterised toilets and bathrooms across all care homes, while some homes also exhibited commercial elements, such as long corridors without personalisation or points of interest. Domesticity, otherwise termed ‘small-scale’ dementia care, can be characterised by a home-like dementia care environment and smaller numbers of overall residents (Smit et al., 2012).

Replicating familiar cues, ensuring privacy, and providing unrestricted access to different areas are all hallmarks of a home and are considered vital for promoting engagement in routines and meaningful activities (Woodbridge et al., 2018), including wandering. Within the current study, Crocus and Geranium provided the most ‘home-like’ features, including dining areas, points of interest, and unrestricted access to their kitchen, laundry room and garden, promoting engagement in meaningful household activities. In future, care home managers should consider ways of recreating modifiable domestic features within care homes, whilst architects designing new homes should keep domesticity at the forefront of care home design. Further, division of larger existing care homes into smaller ‘units’ or ‘wings’ may help to simulate ‘small-scale’ dementia care.

Visual access is a vital consideration to support care home residents living with dementia who engage in wandering behaviours. In addition, visual access can support care home staff to non-intrusively monitor residents for safety. Within the current study, four care homes featured open-plan dining areas, connected to other communal spaces, such as living rooms or kitchenettes, thus facilitating greater visual access than separate, distinct rooms. Prior literature has emphasised that open-plan environments with good visual access are favourable for residents living with dementia (Marquardt, 2011). Nevertheless, for non-purpose-built care homes, creating visual access through an open-plan layout may be unachievable or inaccessible. In such cases, the importance of domestic design features with familiar cues and accessible signage is increasingly important to support safe wandering and orientation (Hock et al., 2025).

## Limitations

While the Wayfind Tool was developed using evidence from the literature and expert input, this study is not without limitations. First, our aims were descriptive in scope and did not seek to evaluate the effectiveness of specific environmental features in improving outcomes related to orientation or wandering. As such, causal inferences cannot be drawn about the relationship between identified environmental characteristics and residents’ autonomy or wellbeing. Second, we did not develop or apply a formalised scoring system. The absence of a quantitative scoring framework limits the ability to compare findings systematically across settings or to generate summary ratings. Finally, the tool was tested in only seven care homes. Although homes were recruited to ensure variation in ownership, funding model, and location, the relatively small sample limits generalisability. Further testing across a larger and more diverse range of care home settings would be needed to refine the tool and assess its broader applicability.

## Implications for Practice

The current study yields important messages for the social care sector. Care home environments have the potential to support orientation and wayfinding for care home residents living with dementia. Many environmental interventions are non-invasive and cost-effective, such as installing signage, lighting and maintaining clear walkways. In addition, prioritising domesticity and ‘small-

scale' care features (hence minimising clinical and commercial features) has the potential to provide familiarity, privacy and spatial orientation cues for residents. It may also be possible to divide an existing care home into smaller 'wings' or 'units' to simulate a more domestic feel. The Wayfind Tool, developed within the current study, can allow care homes to develop greater knowledge of their environmental features that may support or impair wandering and orientation.

A recent realist review highlighted a range of environmental barriers and enablers for safe wandering (Hock et al., 2025); however, earlier work highlighted the crucial role of management in staff feeling like the culture they work in allows them to support residents to wander (Giffiths et al., 2024). Care home environments vary greatly, and relatives play a crucial role in supporting their relative living with dementia to continue to engage in meaningful behaviours, such as wandering, both safely and independently. Regular communication between relatives, care home staff, managers and residents, to consider how residents can be supported to safely and independently engage in wandering within their care home will ensure alignment of all stakeholders. The 'homeliness' of care home environments and features can support residents and relatives to walk together, using support from good lighting, clear walkways and handrails.

When designing new care homes, 'domesticity' and home-like design cues, as well as familiarity, should be prioritised. Visual access between key spaces (e.g., individual rooms and toilets, living rooms and corridors) is also vital to support spatial orientation, wandering, and independent function. Whilst clinical design features may be necessary to promote safety and hygiene within certain spaces (e.g., toilets), reducing overly clinical or commercial features in other areas also holds potential to support functional independence. Nevertheless, further research using The Wayfind Tool is recommended to enhance understanding about the configuration of shared spaces, corridors and furniture to promote function and movement for individuals living with dementia who engage in wandering behaviours.

## Conclusion

This study highlights the critical role of the built environment in supporting residents living with dementia, particularly concerning orientation and wandering behaviours. Our development and application of the novel, evidence-based Wayfind Tool across seven diverse care homes revealed significant heterogeneity in environmental features, challenging assumptions of homogeneity in care home design. Our findings underscore that while core environmental features may be non-modifiable, modifiable features such as points of interest, personalisation, effective signage, appropriate lighting, and accessible seating hold substantial potential for cost-effective and minimally invasive alterations. These modifications can create more supportive, 'home-like' environments, aligning with principles of 'small-scale' dementia care. Given the inseparable interaction between an individual's behaviour and their environment, and the acknowledged influence of the physical setting on individuals with cognitive impairments, there is an evident need to integrate detailed environmental mapping into future dementia care home research. Our newly developed and freely available Wayfind Tool, serves not only as a robust descriptive instrument but also as a potential audit tool to guide environmental improvements within care homes, ultimately promoting independence, well-being, and safety for residents living with dementia who wander.



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## Ethical Considerations

Ethical Considerations Ethical approval for this study was obtained from the Camberwell St Giles NHS Ethics Committee (24/LO/0659) on the 11th November 2024. Organisational representatives provided signed agreements for each care home to participate. To preserve anonymity, each care home was assigned a pseudonym. Additionally, identifiable characteristics have been omitted from results.

## Consent to Participate

Organisational representatives provided signed agreements for each care home to participate.

## Consent for Publication

Not applicable - no individual data published.

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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Data Availability Statement

The data supporting the conclusions of this article are included within the article and its additional file(s).

## Supplemental Material

Supplemental material for this article is available online.

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