Hospital Design for Older People with Cognitive Impairments:
A Review of Evidence-Based Design to Support Inpatients and Accompanying Persons

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Background
Cognitive impairment is not a normal part of ageing, however it is common in hospitalised older patients, with dementia and delirium the most frequent causes. Cognitive impairment in over 38% of patients over 65, and in more than 50% of people aged over 85 years (Reynish 2017).

- Difficulties processing thoughts leading to memory loss
- Impaired decision making
- Inability to concentrate and learning difficulties

People with Cognitive Impairment
Overlap between cognitive impairment, dementia and delirium. Dementia friendly design is a useful and prevalent pragmatic descriptor for inclusive design which includes due attention to cognitive impairment.

Cognitive impairment

Behavioural & Psychological Signs of Distress

Dysfunction in activities of daily living

Gait disorders impacting mobility & stability while walking
Muscular strength loss & associated functional decline
Visual & perception issues related to visuospatial & visuoperceptual defects

Physical frailty
General mobility difficulties & increased fall risks
Partial and severe sight loss
Hearing loss
Circadian rhythm difficulties & sleep disruption

People with Dementia
Sleep disruption  
Lack of normal activities  
Disruption to diet  

Noisy & busy  
Austere & unfamiliar  

Restricted access to outside & nature  
Reduced mobility & activity  

Cognitive impairment / reactive behaviour / difficulties with activities of daily living / impaired mobility, hearing or vision
In Australia, for example, a patient with dementia will have an average stay of 22 days compared to the average of six days for all hospital stays. (AIHW 2012)

In Ireland it is estimated that care associated with dementia in hospitals costs approx. €21 million per year. (Department of Health (IRL) 2014)
Quality of relationships between patients, family members & staff influence cognitive decline, quality of life & other outcomes in people with dementia (Burgener 2002, Benbow 2014)

Accompanying person can ease the hospital experience by being present, providing familiar voices & items, and maintaining routines (Li 2003)

Provide information to the staff regarding the patient’s needs, preferences & usual behaviour patterns (Moyle 2008)
Report of the Irish National Audit of Dementia Care in Acute Hospitals 2014
The majority of wards did not have environmental cues to help the person with dementia orientate themselves. 56% of wards had no clocks visible, 93% of wards had no calendar visible, while 84% of wards had no personal objects visible.

(INAD 2014)
74% of wards did not have signs to locate the toilets visible from the patient’s bed or door of their room.

43% of wards had no signs on their toilet doors while 33% of wards had no signs on their bathroom doors.

54% of wards had no day room or patients’ lounge (INAD 2014)
The Irish National Dementia Strategy 2014

Objective: Hospitals should be dementia-friendly.....This includes environmental aspects as well as clinical support.....
Methodology

Phase 1

• Peer and grey literature review to identify best practice international dementia friendly hospital design approaches and features
• Delphi method to select Key Design Issues to form an analysis framework for phase 2

Phase 2

• Cochrane Systematic Review to identify, appraise and synthesize empirical evidence in relation to the selected Key Design Issues
Phase 2: Cochrane Systematic Review

**Intervention review** to assess the benefits and harms of interventions used in healthcare and health policy.

- Identification of *relevant studies* from a number of different sources (including unpublished sources)
- Selection of *studies for inclusion and evaluation of their strengths and limitations* on the basis of clear, predefined criteria
- Systematic *collection of data*
- Appropriate *synthesis of data*

[https://www.cochranelibrary.com/about/about-cochrane-reviews](https://www.cochranelibrary.com/about/about-cochrane-reviews)
Protocol Outcome Measures:

Primary outcome measures:
- Health related quality of life - EuroQol, Dementia Care Mapping (DCM)
- Measures of function - Barthel Index for Activities of Daily Living
- Measures of behaviour & mood – the Cohen–Mansfield Agitation Inventory
- Quality of sleep - patient self-reporting and staff observation
- Length of stay
- Hospital readmissions
- Wayfinding satisfaction - patient wayfinding satisfaction questionnaires, interviews or staff observation

Serious adverse effects will include:
- Falls, the use of physical restraints, and the number of patients taking psychototropic medication
Protocol Secondary Outcomes:

- **Carer mood or depression** measured with Geriatric Depression Scale - Hospital Anxiety and Depression Scale or the Family Caregiving Burden Inventory.
- **Accompanying person (AP) hospital satisfaction rating** based on AP questionnaires, interviews or similar methods.
Findings

Phase 1: Key Design Issues

Phase 2: Cochrane Systematic Review: Initial Findings
Phase 1:  
Key Design Issues
Key Design Issues

- Participation & engagement
- A people-centred environment
- Patient safety, health & well-being
- Balance sensory stimulation

- Appropriate use of technology
- Space to support the needs of people with dementia
- Orientation & navigation
Phase 2: Cochrane Systematic Review: Preliminary Findings
Engagement with friends, family, staff & community: communal rooms and spaces for interaction; images of locality.

Space & supports for an accompanying person: adequate space & seating beside beds; family zone in room; family rooms.

Engagement & participation
A people-centred environment

- Facilitate personalisation: dedicated lockers or wall space for memorabilia/personal objects
- Use familiar & recognisable design: intuitive & familiar fittings & objects within the ward
- Soften the institutional environment: smaller ward size; more home like colours; more welcoming nurses’ station
Support meaningful activities: kitchen within family room to allow a person make a cup of tea or wash dishes; provision of an outdoor space to carry out light gardening activities.

Support diet, nutrition & hydration: a dedicated dining room or familiar and home−like dining tables and chairs.

Provide a safe environment: handrails and grabrails for stability; non−slip floors.
Contact with nature: good views to nature; internal planting; images of nature

Optimise positive sensory stimuli: views: pleasant daylight; a gentle breeze from outside

Minimise negative stimuli: control excessive glare; acoustic panels to absorb sound

Access to outdoor spaces: garden space, balconies or roof terraces directly accessed from the ward
Legible environment: good colour contrast between walls/floors so key building elements are legible & spaces are easily understood.

Enhance orientation to date, time & location: large format clock/calendars; external views to prominent landmarks; or internal images of the local context.

Way-finding for navigation: colour panels or doors as a visual cue; wayfinding signage, images or symbols for directional information.

Good visibility/visual access: higher illumination; direct views from bed to WC door; glazed internal doors or panels.
Space to support a person with dementia

Space for **belongings**

**Family Zone** in patient room
Space to support a person with dementia

Space and supports for patient mobility & activities: generous circulation areas to encourage walking within the ward; handrails in corridor for stability; small seating & interest areas along corridors to provide resting and destination points.

Communal areas in single-bed wards: family rooms or social areas in circulation space

Space for retreat in multi-bed wards: family /day rooms
Challenges: confounding variables and heterogenous data

- Difficulties with Randomised Control Trials or Cluster–Randomised Trials in relation to the built environment
- Confounding variables – improved or new models of care; staffing levels; staff training etc.
- Heterogenous data - clinical, methodological and statistical heterogeneity in the studies and results
Conclusion: Positive developments

- Growing recognition of the need for more supportive hospital environments for people with cognitive impairment & dementia.

- Contemporary hospital design with a focus on universal design, biophilic design, salutogenic design, and generally a less clinical/more humane design is naturally a more supportive design for people with cognitive impairment & dementia.

- Currently still a lack of rigorous studies specific to the built environment, but this is changing and more data to underpin evidence based design is available through journals such as Health Environments Research and Design (HERD).
Thank You
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More Information available online at
www.trinityhaus.tcd.ie

www.trinityhaus.tcd.ie/dementiafriendlyhospitals/