



# **Dementia Friendly Hospitals from a Universal Design Approach**

**Key Research Findings Report**

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(See Acknowledgments opposite for all members of the Steering Committee)

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## Research Team:

This project was undertaken by TrinityHaus, TCD, Tallaght University Hospital and O'Connell Mahon Architects, in collaboration with the co-authors above and steering committee opposite. For more information on this research, or other work in this area please visit [www.trinityhaus.tcd.ie](http://www.trinityhaus.tcd.ie)



O'Connell Mahon Architects |



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## Steering Committee:

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# Foreword

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Growing recognition of the high prevalence of dementia has forged a new reality for the Irish health services. A significant proportion of those using these services will have challenges with memory and other aspects of brain functioning which can pose significant challenges to negotiating the complex physical environments within which healthcare is delivered.

This is especially the case for hospital environments which of their very nature provide a wide range of services often distant from each other, and also transitions in care from a wide array of departments.

In addition, areas where patients may spend considerable lengths of time, such as wards and out-patients, are often designed without due attention to wayfinding and providing a sense of identifiable and secure space for those with problems with memory and other aspects of brain function.

This report is of particular significance as it represents a detailed assessment of design and user interactions in a number of major hospitals in Ireland for appropriateness for dementia care. In this it draws on, and adds to, an emerging international knowledge base in designing environments to support those compromised by the limitations of memory, and in particular explores the views and needs of service users and those involved in their care.

In addition, it responds to the deficits in environmental design highlighted in the Irish National Audit of Dementia, in which a number of the authors involved in the research behind this current report took a leading role.

The philosophy of the report is based on the principles of Universal Design, and is novel for the global scale of its scope, which includes arrival at the hospital, the problems of parking, as well as the more usual focus on clinical areas. This approach has been previously used by the authors of this report in a highly original report on design of domestic environments for people living with dementia.

The authors are deeply grateful to the HRB for funding this work, and to the patients, relatives, staff and management of Tallaght Hospital, Naas General Hospital, and Peamount Healthcare, as well as the Steering Committee, for their generosity with time and considered reflections.

We would also like to thank HBS Estates at the HSE, the National Dementia Office, and the Centre for Excellence in Universal Design for their support throughout this project.

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Tallaght University Hospital/Trinity College Dublin**

# Executive Summary

## Background

For many patients the hospital is challenging due to the busy, unfamiliar, and stressful nature of the environment. For a person with dementia the hospital experience can be exacerbated by cognitive impairment and behavioural or psychological symptoms, and can therefore prove to be a frightening, distressing, and disorientating place.

The Irish National Dementia Strategy (Department of Health, 2014) states that up to 29% of all patients entering acute care public hospitals in Ireland may have dementia. In this context, the Irish National Audit of Dementia Care in Acute Hospitals 2014 (de Siún et al., 2014) is significant in that it found that 94% of hospitals have no dementia care pathway, and that people with dementia will often experience poor health outcomes, remain longer in hospital, and are at greater risk of mortality once admitted. Among a number of themes, the audit identifies the importance of the 'Physical Ward Environment', and reiterates the challenges presented by the hospital setting. It acknowledges that hospitals are designed primarily for surveillance, security and infection control, and therefore incompatible with the needs of people with dementia. The audit presents a number of issues concerning the physical environment including: the lack of orientation cues, including clocks, calendars or personal possessions; inadequate wayfinding and signage; and, a minimal use of dementia friendly colour schemes or labelling.

In response to these issues Tallaght Hospital (AMNCH) and TrinityHaus, Trinity College Dublin have completed a research project, funded by the Health Research Board (HRB), investigating dementia friendly design for acute care public hospitals. This has examined how the physical hospital environment might provide a better experience for people with dementia, and also how hospitals can be designed to enable family members and carers to provide support for the person with dementia throughout their visit to the hospital.

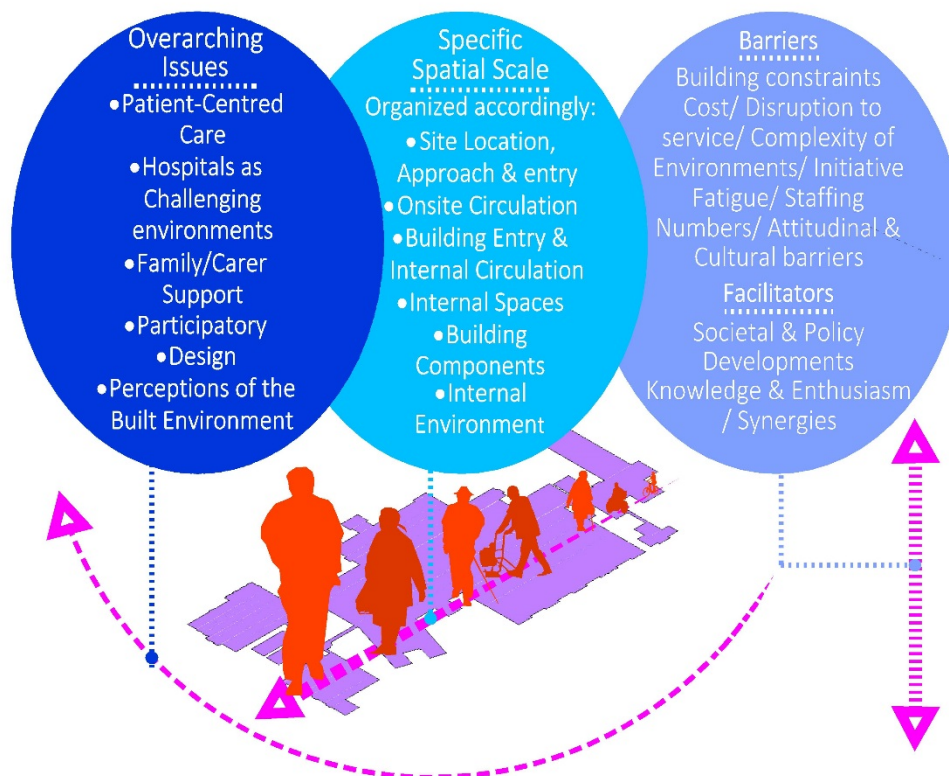
## Methodology

The findings presented in this report are based on an in-depth literature review; desk-based case studies; site visits to St. James's Hospital, Connolly Hospital Blanchardstown, and Mercy University Hospital Cork; and detailed onsite building analysis in Tallaght Hospital, Naas

General Hospital and Peamount Healthcare. A thematic analysis was employed to analyse and generate key themes emerging from the stakeholder engagement process, and these themes in turn, form the basis of key findings and recommendations.

## Key Findings

The main finding emerging from the research are organised in three groups including:



**Overarching Issues:** A number of salient considerations have emerged that should underpin any dementia friendly design process. Firstly, while it may be obvious in the context of healthcare, it is still important to stress that patient-centred care should be at the heart of hospital design.

Secondly, and in the context of patient-centred care, this research confirms that hospital environments are indeed very challenging for people with dementia, and therefore, the third finding regarding family support is of crucial importance.

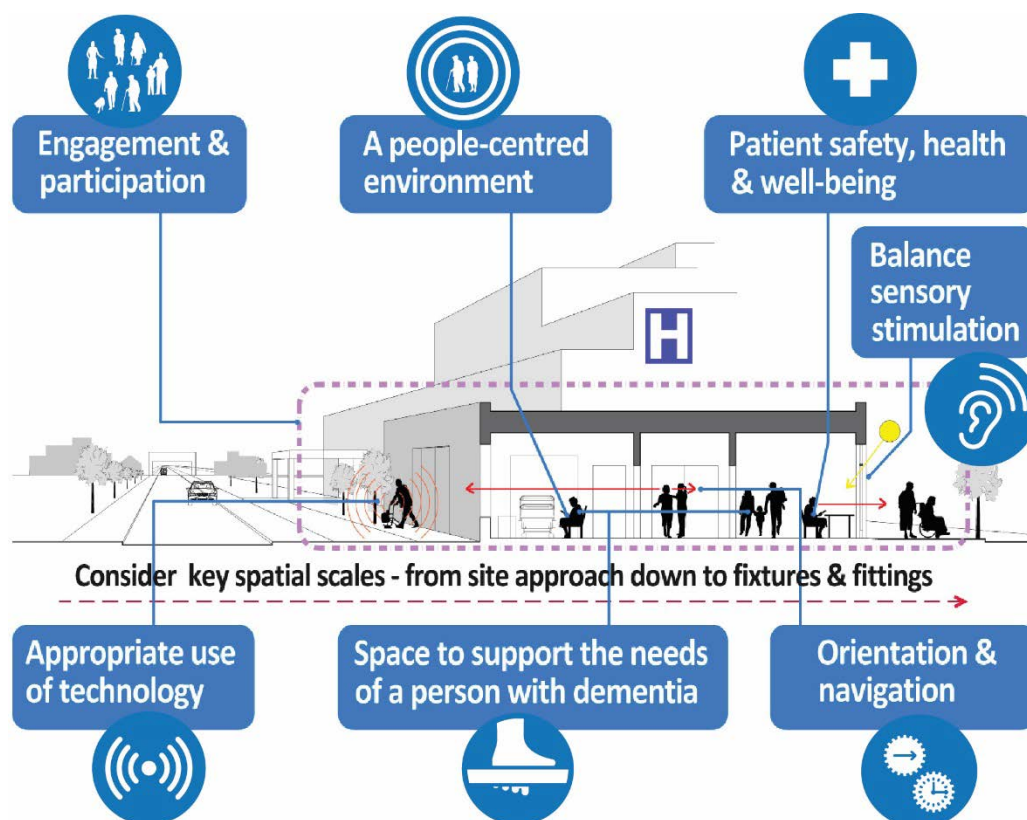
Finally, while participatory design should be at the heart of the design process, there are significant challenges in this regard when dealing with some people with dementia. This extends to family members and carers who are often compelled to speak on behalf of the

person with dementia. Alternative co-design processes and tools must be investigated in this regard.

**Design Issues for the Hospital as a Whole and across Principal Spatial Scales:**

Firstly, a range of ‘Key Dementia Friendly Design Issues’ have been selected from the literature consisting of 18 Key Dementia Friendly Design Issues spread across seven main themes. These themes include: A) supporting engagement and participation; B) providing a people-centred environment; C) design to balance sensory stimulation; D) supporting orientation and navigation; E) providing adequate space to support the specific needs of a person with dementia; and, finally F) the appropriate use of technology.

Secondly, these design issues apply to the hospital as a whole, emphasising that a person will experience the hospital as a whole when they enter from the community and travel through the hospital to their destination. This continuum of external and internal places and spaces forms the public realm of the hospital. In this context, the Universal Design approach promotes accessibility, usability and ease of understanding across the full travel chain, from approaching and entering the hospital campus, right down to entering a specific department or room. A high quality hospital public realm is critical to supporting this travel chain and to ensuring a dementia friendly and Universally Designed hospital setting.



There are also major implications for design issues at specific spatial scales within the hospital, from the location of the hospital down to individual building components. These not only support the travel chain and public realm discussed above, but determine how a person experiences and is supported by each individual space within the hospital.

Thirdly, and again referring to various spatial scales, a number of dementia design related difficulties were identified in Tallaght Hospital including: disorientation to time and place; wayfinding challenges; issues regarding patient access to hospital campus and buildings; site design and pedestrian or vehicular facilities issues; entry and reception issues; difficulties regarding hospital layout and key internal spaces; inadequate space provision; lack of outdoor spaces; lack of supports for persons with disabilities; interior design issues; problematic building components; and, challenging internal environment conditions such as lighting issues.

**Barriers and Facilitators to Implementing Environmental changes or New Design Approaches:** Dementia friendly design requires a change in mind-set and the adoption of different design approaches, that in many ways align with good design practice. Nevertheless, it is important to recognise both the potential barriers and facilitators that exist in the hospital context.

In terms of barriers, various concerns emerged including: the complexity and size of the hospital environment; the physical constraints of existing buildings; cost; disruption; initiative or improvement fatigue; staffing levels; and finally, attitudinal or cultural barriers.

Regarding facilitators, there are a number societal and policy developments, and existing conditions that are encouraging from a dementia design perspective, including: positive societal and policy developments regarding ageing and dementia; growth of patient-centred healthcare; greater awareness and understanding about the impact of the built environment; and Universal Design. Staff knowledge and enthusiasm round dementia friendly design is encouraging, while there is great potential for leveraging the synergies between various hospital improvement initiatives that have emerged in recent years.

Finally, the research demonstrates a shift towards more people centered and healthful hospital design in general. In this regard, there is a clear convergence between a dementia friendly approach and general best practice contemporary hospital design, a reassuring



finding that illustrates how dementia based research can contribute to the developing knowledge base and evidence around good hospital design.

## **Conclusion**

On the one hand this research confirms the negative impact of the acute hospital setting on many patients with dementia. However, on the other hand it illustrates the positivity and expertise that exists in a typical hospital around the needs of people with dementia, and demonstrates a genuine willingness to improve the physical environment in this regard.

The research shows that there are many evidence based design features and well supported design guidelines to support dementia friendly hospital design. It also reveals however, that while participatory design is a central component of a patient-centred and family friendly approach, there are real challenges around co-designing and participation for people with dementia, partly due the symptoms of dementia, but also related to family/carer input.

Finally, the research identifies some key potential barriers to implementing dementia friendly design in hospitals, but more importantly it points to many positive developments, initiatives, and conditions that if properly harnessed, could support changes towards a more dementia friendly and Universally Designed environment in hospitals. This will support a wide and diverse range of patients, visitors and staff of all ages, sizes, abilities and disabilities, while also helping hospitals to fulfil their role as caregiving and healing facilities.

Clean hands  
save lives...  
are You in there?

Main Entrance

WELCOME TO THE BRIDGE & BURN  
HOSPITAL AND COMMUNITY  
HEALTH CENTRE  
TO SLOW ROTATION PRESS BLACK BUTTON

PLEASE BE PROUD  
OF YOUR  
SIDE DOORS

# Part A

# Introduction

# I. Introduction

## Research into Dementia Friendly Hospital Design

### I.1. Introduction

Tallaght Hospital (AMNCH) and TrinityHaus, Trinity College Dublin were awarded research funding by the Health Research Board in 2015 as part of Applied Research Projects in Dementia 2015 programme to carry out research into dementia friendly design for Irish acute care public hospitals. This programme is being administered by the HRB in collaboration with The Atlantic Philanthropies and the Department of Health.

This research has examined how the physical hospital environment can provide a better experience for people with dementia. It has also examined how hospitals can be designed to enable family members and carers to provide the continued and consistent support of a familiar and trusted figure for the person with dementia throughout their visit to the hospital.

The research examined national and international literature and case studies, and involved onsite evaluation of three Irish-based hospital case study sites to inform the findings. Further to this, people with dementia and their families and carers were consulted to ensure that their needs and preferences underpin the research.

#### I.1.1 Key Definitions

To ensure that there is a common understanding of the key concepts and terms associated with this research, we are setting out a few key definitions, including:

- **Dementia:** Dementia is a general clinical term used to describe a group of disorders (the most common of which is Alzheimer's disease) with different causes but similar symptoms. These symptoms include impaired memory, judgment, reasoning, problem-solving skills and impairments in language, communication and social skills. Dementia is a progressive condition. As time passes, the person with dementia will inevitably need help with both simple and complex tasks.

- **Dementia Friendly Design:** The design of products, services and the built environment to take into account the physical, sensory and cognitive needs of people with dementia, while also supporting other users such as family members, carers, and hospital staff.
- **Acute Care Public Hospital:** Public hospitals in Ireland delivering various emergency, diagnosis, and treatment services to a wide range of inpatients and outpatients. Acute care public hospitals are also referred to as acute hospitals or general hospitals. Unless specified otherwise, the acute care public hospital will be simply referred to a ‘hospital’ throughout this report.
- **Dementia Friendly Hospital:** For the purposes of this research, this refers to the overall hospital environment, from access and circulation, through to finishes, fittings, and furniture, as well as artwork and technology to support a dementia friendly design approach.
- **Family member and carer:** In the context of this research, this refers to an individual who is familiar to the person with dementia and is involved in their life.

### **1.1.2 Duration**

This research was conducted between November 2016 and March 1, 2018.

### **1.1.3 Project Partners**

- Professor Desmond O’Neill - Principal Investigator – Tallaght University Hospital and TCD.
- Tom Grey - TrinityHaus, TCD.
- Dimitra Xidous - TrinityHaus, TCD.
- Dr. Sean Kennelly – Tallaght University Hospital and TCD.
- Cathy McHale - Tallaght University Hospital
- Eimear Digan - Tallaght University Hospital
- Susan Lawson – Tallaght University Hospital
- Gillian Harte - Tallaght University Hospital
- Mary Hickey - Rose Cottage, Alzheimer’s Society of Ireland.
- Seamus Cunningham - Irish Dementia Working Group.
- Dr. Ger Craddock - CEUD/NDA.

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- Anna de Siún - NDO
- Sean Mahon MRIAI - O'Connell Mahon Architects.
- Victoria Mannion - O'Connell Mahon Architects.
- Matthew Gibb - DSIDC, St. James's Hospital.
- Susan O'Reilly - Connolly Hospital Blanchardstown.
- Áine Coe - Naas General Hospital
- Anne O'Hea - Mercy University Hospital Cork

## **1.2. Aims and Objectives**

### **1.2.1 Overall Aim**

The overall aim of this research is to examine how the physical hospital environment can provide a better experience for people with dementia. As part of this it is vital to investigate how hospitals can be designed to enable family members and carers to provide the continued and consistent support of a familiar and trusted figure for the person with dementia throughout their visit to the hospital.

### **1.2.2 Project Objectives**

Key objectives of this research project include:

- Engage with key stakeholders and examine the literature to understand how a person with dementia, their families or carers experience the physical hospital environment (i.e. from entry and admission, to circulation and the use of key treatment or ward spaces, to exiting the hospital grounds).
- Investigate in detail selected dementia friendly hospital designs through a series of desk-based case studies to illustrate the key principles, approaches and features associated with dementia friendly design in these hospitals
- Conduct detailed case studies of Tallaght Hospital, Naas General Hospital, and the Age-Related Rehabilitation Unit in Peamount to engage directly with people with dementia

who use these hospitals, their family members, and carers; in addition to staff and management. This will be carried out through a number of onsite user-centred research and design exercises to determine the opportunities, barriers, costs and solutions in these hospitals.

- Conduct stakeholder workshop No. 1 to discuss the main findings. This workshop will represent a mix of healthcare professionals, hospital management, building design professionals, and PwD who use these hospitals, along with their family members, and carers where appropriate. Various stakeholder engagement and participatory design techniques, and the review of the audit tools will be discussed.
- Use the findings and recommendations to underpin and prepare ‘Dementia Friendly Hospital Design Guidance’ containing both stakeholder engagement and participatory design techniques. This guidance will be underpinned by the Universal Design approach.
- The development of a prototype ‘Irish Dementia Friendly Hospital Design Audit Tool’, adapted from the King’s Fund assessment tool but specifically tailored to the Irish context.
- Disseminate key project related activities and outcomes throughout the project and for an agreed period of time following the completion of the project across a range of social media platforms.

### **1.3. Overall Research Methodology**

This research project was based on the following main components including:

- A review of the literature examining the following: the needs of people with dementia and their family members within the acute care hospital setting; dementia friendly design generally and within the hospital context; and, the manner in which the hospital environment can support accompanying persons, such as family members, to continue caring for a person during the hospital stay.
- Desk-based case studies (International, UK and Irish-based) to interrogate best practice hospital design.



- Detailed site-based building analysis and stakeholder engagement process in the three case study sites involved in this research to produce a thematic analysis of the main findings.
- A stakeholder engagement process comprising of the following elements: stakeholder workshop, stakeholder interviews (structured and semi-structured), stakeholder questionnaires (on-line and hard-copy), and ad hoc engagement.

## **I.4. Report Structure**

Chapter 2 sets out the background issues regarding designing for dementia and outlines the key aspects and challenges within the hospital setting. It introduces Universal Design and discusses how this provides an overall framework for dementia friendly design.

The literature review is detailed in Chapter 3, while Chapters 4, 5 and 6 set out Irish, UK and international cases studies. Chapter 7 describes the building analysis conducted in Tallaght, Naas, and Peamount, along with resulting themes evolving from the thematic analysis. The stakeholder engagement process and findings from the stakeholder workshop, stakeholder interviews, and the on-line questionnaire are detailed in Chapter 8. Finally, chapter 9 brings the material together in the form of a set of key findings and discussion.

## 2. Background

### 2.1. Introduction

This chapter sets out the background for this research including the benefits and challenges for designing for people with dementia, and how dementia friendly design is particularly relevant in the context of the acute general hospital, as well as developments regarding designing for health, various hospital improvement initiatives, and the underlying concepts underpinning dementia friendly design. Finally, this chapter introduces Universal Design and describes how these design principles are used on the one hand as a framework to support and structure dementia friendly hospital design, and on the other to ensure that any design approach not only benefits people with dementia, but also patients, family members, visitors and staff of all ages, sizes, abilities and disabilities.

### 2.2. Designing for People with Dementia

The interaction between an individual and the physical environment was described by Kahana (1974), Lawton (1982, 1977) and others as the ‘Person-Environment fit’. Central to this model is the concept of ‘environmental press’, where the physical environment directly impacts on a person’s ability to operate within a particular setting (Eisdorfer and Lawton, 1973). For a person with dementia, this environmental press may increase due to the symptoms of dementia, and in turn restrict their ability to function or undertake activities. Therefore, to design environments that support people with dementia, it is important to understand the key symptoms to facilitate a better person-environment fit, as described above.

Dementia is an umbrella term to describe a group of disorders caused by several diseases and conditions, with Alzheimer’s disease and Vascular Dementia being the most common (Cahill et al., 2012b). When outlining the symptoms of dementia in terms of the built environment, Fleming and Bennett (2014) refer to Burns (2001), and provide the following broad classification:

- **Cognitive impairment:** indicated by problems with memory (amnesia), speech or understanding of language (aphasia), a failure to carry out physical tasks despite having



intact motor function (apraxia), and failure to recognise objects or people despite having knowledge of their characteristics (agnosia).

- **Reactive behaviour, formerly described as Behavioural and Psychological Symptoms (BPSD):** cognitive impairment may be accompanied by symptoms such as depression, delusions, hallucinations (visual and auditory) – and behaviours such as wandering, incessant walking or agitation, which are thought to represent responses to altered perception of environments and interactions, or reaction to unarticulated stress, pain, disorientation, or other discomforts.
- **Dysfunction in activities of daily living (ADL):** in the early stages of dementia these can include more complex difficulties with shopping, driving or handling money. In the later stages more, basic tasks are affected such as dressing, eating and bathing.

Given that increasing age is one of the strongest risk factors for dementia (Cahill et al., 2012a), it is also important to consider other age-related changes that a person with dementia may experience such as:

- Physical frailty
- Mobility difficulties leading to increased risks of falls
- Visual impairments
- Hearing loss
- Circadian rhythm difficulties (DSDC, 2012).

These impairments may be exacerbated by dementia, as the person with dementia may fail to comprehend, or compensate for these difficulties (Marshall, 2009).

## 2.3. Irish Context for this Research

Currently it is estimated that 55,000 people are living with dementia in Ireland. The Irish National Dementia Strategy was launched in December 2014, the aim of which centres on meeting the needs of people with dementia; furthermore, the strategy also aims to address the needs of people who will be diagnosed in the future. The strategy promotes a greater focus on timely diagnosis of dementia and on the value of early intervention, along with the long-term objective of awareness-raising and enhancing understanding among people in Ireland of the needs of people with dementia, and of their societal and community contributions.

To this end, Understand Together is a public support, awareness and information campaign. Among its objectives, and of most relevance to this research, the Understand Together campaign aims to help communicate the lived experience of people living with dementia and those caring for them; promote the uptake of dementia awareness training and promote information about brain health and ways to prevent dementia; build on and support greater co-ordination of dementia programmes and initiatives across Ireland; and, provide reliable information about dementia and signposting to services and supports to help those living with dementia, those caring for them, and health professionals.

There are approximately 50 acute care public hospitals in Ireland (HSE National Projects Office, 2016) delivering various emergency, diagnosis, and treatment services to a wide range of inpatients and outpatients. In line with international practice, these acute care public hospitals differ from other healthcare settings, such as primary health care centres or community hospitals, in that they primarily “treat sudden, often unexpected, urgent or emergent episodes of injury and illness that can lead to death or disability without rapid intervention. The term acute care encompasses a range of clinical health-care functions, including emergency medicine, trauma care, pre-hospital emergency care, acute care surgery, critical care, urgent care and short-term inpatient stabilization” (Hirshon et al., 2013). Notwithstanding this definition, a number of these hospitals also provide non-acute services such as outpatient clinics, age-related day hospital facilities, or maternity care as part of the overall service.

The Irish National Dementia Strategy (Department of Health, 2014) states that up to 29% of all patients entering these acute care public hospitals (henceforth referred to as hospitals) may have dementia and that the costs associated with dementia care in these hospitals is approximately €21 million per year. In discussing the care of people with dementia in hospitals, Cahill et al (2012a) concur with the literature (Galvin et al., 2010, Moyle et al., 2008) and argue that this can be a frightening and distressing experience.

The hospital setting can prove challenging for many people due to the change of environment, stress and possible sleep deprivation (Hanley, 2004). This may lead to poorer health outcomes, particularly for a person with dementia. When a person with dementia becomes hospitalised without the dementia having been diagnosed, the situation can be worse and may lead to additional problems such as injuries, malnutrition, over or under

medication, or similar (Galvin et al., 2010). Moyle et al (2008) argue that many hospitals are not designed to care for people with dementia, and this not only undermines their care (see Galvin et al), but also adds to the burden of care for the staff. According to these authors, negative factors in the typical hospital can include: communication difficulties due to the busy hospital setting; multiple and competing stimuli; and, inability to deal with wandering. They also speak about the important supporting role played by family members and caregivers, a role which is often hard to maintain within the hospital setting (Li et al., 2003).

In light of these findings, the results of The Irish National Audit of Dementia Care in Acute Hospitals (de Suin et al., 2014) are very significant. This audit has found that 94% of hospitals have no dementia care pathway in place, and that people with dementia will often experience poor health outcomes; remain longer in hospital; and, are at greater risk of mortality once admitted to hospital.

The audit outlines ten themes, ranging from ‘Governance’ to ‘Palliative Care’; however, the theme ‘Physical Ward Environment’ is most relevant to this current research. Reiterating the challenges presented by typical hospital settings, this audit acknowledges that hospitals are designed primarily around surveillance, security and infection control, and are therefore incompatible with the needs of people with dementia. The report presents a number of issues concerning the physical environment of many wards including: the lack of orientation cues, including clocks, calendars or personal possessions; inadequate wayfinding and signage; and, a minimal use of dementia friendly colour schemes or labelling.

Based on these findings the authors recommend the development of dementia friendly ward design guidelines for both new-build and refurbishment. They argue that these must include “safe walking spaces and the use of colour, lighting, signage, orientation cues and space to promote social interaction” (De Siún et al., 2014,p.93).

In response to this audit, The Irish National Dementia Strategy (Department of Health, 2014) has proposed a number of objectives and actions regarding to dementia friendly hospitals.

Firstly, in relation to ‘Integrated Services, Supports and Care for People with Dementia and their Carers’ the strategy sets out the following objective:

Hospitals should be dementia-friendly from admission to discharge/death. This includes environmental aspects as well as clinical support (IBID.p.24).

Secondly, in terms of actions the strategy outlines the following:

Hospitals will be required to ensure that people with dementia have a specific pathway through Emergency Departments and Acute Medical Units that is appropriate to their particular sensory and psychosocial needs (pg.29).

The Health Service Executive will develop guidelines on dementia-friendly ward specification to be taken into account at the design stage of all refurbishments and new builds. Elements to be considered should include safe walking spaces and the use of colour, lighting, signage, orientation cues and space used to promote social interaction (pg.30).

## 2.4. Design for Health

The Irish National Dementia Strategy and the Irish National Audit of Dementia Care in Acute Hospitals identify the importance of good design for supporting people with dementia. Dementia friendly design is part of a growing evidence based design approach which recognises the influence of the built environment and seeks to create settings that support human health and wellbeing, particularly the healthcare environment. Over the years rigorous studies have linked various environmental conditions to patient and staff welfare including: noise (Hilton, 1985) and acoustic conditions (Blomkvist et al., 2005), the presence of windows (Keep et al., 1980) and views (Ulrich, 1984), the level of sunshine in rooms (Beauchemin and Hays, 1996), single versus multiple occupancy rooms (Shirani et al., 1986), and art interventions (Staricoff et al., 2003).

Lawson et al (2002) compare new-build and older hospital accommodation and demonstrate how patients, despite being unwell, are quite aware of environmental qualities. Not only did patients prefer the design, layout, natural light and views from the newer environments, but there were also clinical improvements including reduced length of stay for some conditions and reduced requests for pain-killing medication.

Roger Ulrich, one of the key researchers in this area, has developed a ‘Theory of Supportive Design’ which proposes that “the capability of healthcare environments to foster improved outcomes is linked to their effectiveness in promoting stress reduction, buffering, and coping.” (Ulrich, 2001).p.53. In a wide ranging ‘Review of the Research Literature on Evidence-Based Healthcare Design’ Ulrich et al (2008) confirmed the connection between the design of hospital environments and key patient and staff outcomes. These outcomes centred largely around three themes: firstly, patient safety, for instance infections, medical errors, or falls; secondly patient outcomes, for example pain or length of stay; and finally, staff outcomes such as stress or injuries.

Following these results Ulrich et al (2008) propose a number of design recommendations including: single-bed rooms; access to daylight and appropriate lighting; provide family zones in a patient’s room (i.e. dedicated space with comfortable furniture); noise-reducing finishes; views of nature; minimizing negative distractions for healthcare workers (i.e. provide good acoustics and lighting); and acuity-adaptable rooms (i.e. rooms that can be adapted to changing patient needs to avoid patient transfer).

Ulrich's concept of supportive design moves beyond only mitigating the negative effects of the hospital environment, and points the way towards a more active healthful approach:

“At a general level, the process of supportive healthcare design begins by eliminating environmental characteristics that are known to be stressful or can have direct negative impacts on outcomes (loud noise, for instance). Additionally, supportive design goes a major step further by emphasizing the inclusion of characteristics and opportunities in the environment that research indicates can calm patients, reduce stress, and strengthen coping resources and healthful processes.” (Ulrich, 2001).

This actively healthful approach is taken up by the Health-Promoting Hospitals concept (WHO, 1997, Pelikan et al., 2001), defined by Dietscher et al (2017) as:

“...actively attempting to integrate health promotion criteria into its decision premises and processes, and, consequently, taking comprehensive and continuous action to promote the health of its patients, staff, and the population in the community it serves”

In this context, the theory of ‘Salutogenics’ is also gaining traction. Developed by Antonovsky (1979, 1986), salutogenics focuses on what keeps people healthy, and considers illness and health as different points on the same health continuum. In this way it differs from, but compliments the more traditional pathogenic perspective. Central to Antonovsky's theory is a sense of coherence, and this coherence was underpinned by ‘meaningfulness’, ‘manageability’, and ‘comprehensibility’ (Becker et al., 2010).

According to Golembiewski (2010), the salutogenic framework and a sense of coherence has particular relevance for architecture, especially in the healthcare setting. In this regard, he argues that the built environment relates to meaningfulness, manageability, and comprehensibility, through the fact that the environment can be seen as

“as a source of meaning, as a sphere of influence and for its readability. From the point-of-view of mental health design, the salutogenic framework provides a direct link between architectural language and psychiatry” (p103).

## 2.5. Hospital Improvement Initiatives in Ireland

Patient-centred care is the provision of care that is ‘respectful of, and responsive to, individual patient preferences, needs and values, ensuring that patient values guide all clinical decisions’ (Institute of Medicine, 2001). Overall initiatives such as National Standards for Safer Better Healthcare list patient centred-care as one of the key dimensions used to describe quality in health care, alongside safety, effectiveness, efficiency, access, equity, and promoting better health (HIQA, 2012). These dimensions, working in tandem with each other, have obvious implications for the design and its contribution to the effective and efficient delivery of health care in the context of the hospital. What follows is an overview of a select number of hospital improvement initiatives in Ireland. Each one highlights ways in which design of the physical environment promotes patient well-being, improves overall health outcomes, and recognises and supports human dignity.

### 2.5.1 Lean Six Sigma for Healthcare

Lean Six Sigma is a business improvement methodology that merges tools and principles from both Lean, a process improvement methodology used to deliver products and services better, faster, and at a lower cost, and Six Sigma, a data driven process improvement methodology used to achieve stable and predictable process results, reducing process variation and defects (Laureani and Antony, 2017). Lean Six Sigma projects in healthcare settings have largely focused on direct care delivery, administrative support and financial administration (de Koning et al., 2006).

One of the key healthcare initiatives based on the principles of the Lean Six Sigma methodology is the Productive Ward and is discussed in more detail in the next section.

### 2.5.2 Productive Ward

The Productive Ward initiative was designed and developed in 2005 by the UK’s National Health Service Institute for Innovation and Improvement. With an emphasis on patient safety, the Productive Ward Initiative aims to: increase the proportion of time nurses spend in direct patient care; improve experience for staff and for patients; and make structural changes to the use of ward spaces to improve efficiency in terms of time, effort and money (White et al., 2014). The Productive Ward is a self-directed programme made up of 13

modules, each of which provides tools and guidance to assist nurses in making the necessary changes to their ward environment and work processes (HSE, 2017).

In Ireland, the HSE's Office of the Nursing and Midwifery Services Director established a national advisory group in 2010 to oversee a phased national implementation of the Productive Ward, with an initial 21 wards in Ireland commencing module implementation in December 2011, followed shortly thereafter by a second recruitment round in 2012 (White 2014).

According to HSE reporting, almost all the sites involved in the project have improved their direct patient care times by the following means: reducing interruptions; introducing patient status at a glance boards with real-time patient information; and, redesigning their ward environment to reduce waste and unnecessary walking. With regards to impacts relating to reducing costs, HSE reporting highlights substantial once-off stock savings in many sites, while the introduction of appropriate stock itemisation and levels have reduced monthly stock expenditure. Finally, in the context of patient safety, implementation of the Productive Ward has led to improvements in unplanned absenteeism, patient falls, hospital acquired infection, and patient ID band compliance (HSE, 2017).

### **2.5.3 Hospice Friendly Hospital Programme**

The physical environment, as well as the overall clinical nature of hospitals can detract from the dignity afforded to patients and their families, even with hospital staff working to provide the best possible care for people at the end of their lives (Waller et al., 2008). This is especially true for the person nearing the end of life, where, among other things, the hospital environment may not afford the patient, their loved ones the space and privacy needed for intimate discussions and special moments, or, in the case of staff, this lack of space translates to them having to deliver difficult news to families in a public space (ref Design for Dignity).

The Enhancing the Health Healing Environment (EHE) programme, was launched by the Kings Fund in 2000. Recommendations regarding end of life care stemming from the pilot projects undertaken as part of this programme include:

- A room where patient and family can be taken for confidential discussions.



- The option of a single room accommodation designed to engender a feeling of homeliness where patients retain control over their environment.
- Informal gathering spaces and places where families can meet, confer and talk with care staff.
- Guest rooms where close family or friends can stay overnight with facilities for catering and internet access
- Appropriate places for ‘viewing’ the deceased (Waller et al., 2008).

Similarly, in Ireland, the aim of the Design and Dignity project is to make death more bearable for those at end of life and for family and friends sharing that final journey (Irish Hospice Foundation, 2017) (See – [www.hospicefoundation.ie/design-dignity](http://www.hospicefoundation.ie/design-dignity)). This aim is accomplished by: transforming the way hospital spaces are designed for people at the end of life and their families; fostering a sense of ownership of the hospital environment through engagement with hospital staff in the design process; and, creating exemplar end-of-life care facilities in public hospitals and setting the standard for other hospitals to follow. Key elements related to the improvement of interior and exterior spaces in end of life care hospital settings include: colour, lighting, artwork, acoustics, fabrics, furniture, and planting (Lovegrove and Rose Roberts, 2014).

#### **2.5.4 Genio Dementia Programme**

The Irish Health Service Executive (HSE) and Genio<sup>1</sup> Dementia Programme 2012 to 2018, which is being supported from the philanthropic organisation Atlantic Philanthropies<sup>2</sup>, is an initiative to develop and test new services and community-based supports for people with dementia<sup>3</sup>. One of the main elements of this programme involves ‘Integrated care pathways in the acute hospital sector for people with dementia’. This focuses on the acute hospital setting to develop care pathways to improve the overall experience for a person with dementia from admission to discharge. The Genio hospital sites are discussed in further detail in Chapter 4, Irish Dementia Friendly Hospital Design Exemplars.

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<sup>1</sup> Genio is an Irish-based non-profit organisation working with government and philanthropy to transform social services - see <https://www.genio.ie/>

<sup>2</sup> See <http://www.atlanticphilanthropies.org/>

<sup>3</sup> See <https://www.genio.ie/our-impact/research-evidence/hse-genio-dementia-programme-overview>

## 2.5.5 Infection Prevention and Control Building Guidelines for Acute Hospitals in Ireland

Appropriate design of the physical environment in hospitals should reflect a balance between, on the one hand, patient well-being and satisfaction, delivery of medical care, staff satisfaction, and reduction in healthcare costs, while also playing a critical role in preventing healthcare-associated infections (HCAI), through the provision of sufficient single-patient rooms, ample physical space in clinical areas, and an environment that can be readily cleaned and decontaminated (HSE Health Protection Surveillance Centre, 2008).

With this in mind, the HSE Infection and Control Building Guidelines for Acute Hospitals in Ireland developed in 2008 (ibid), sets out a number of recommendations intended to minimize the risk of infection in hospitals, in the following areas:

- Planning and Governance, including recommendations on planning and design, consultation with the infection control team at every stage of the planning and design process, and sign-off on completed projects.
- Inpatient accommodation for new hospital builds or major renovations, including recommendations related to the proportion and design of single-patient rooms, as well as to the design of multiple bed wards; recommendations related to ward layout and fixtures; recommendations in relation to proportion and design of airborne isolation rooms; and, recommendations regarding communicable disease surge capacity.
- Inpatient accommodation in existing acute hospitals, including specific recommendations related to infection prevention and control and hospital refurbishment, hospital development plans, and internal re-configuration (ibid).

Each one of the above initiatives highlights ways in which the physical environment contributes to patient well-being, improves overall health outcomes, and recognises and supports human dignity; furthermore, these initiatives provide a context for a dementia-friendly hospital approach, in so much that they demonstrate that the need to support the delivery of effective and efficient healthcare, via appropriate design that is, among other things, anchored in the recognition that putting the patient at the centre of that care is central to promoting overall health and well-being of the individual.

## 2.6. Design for Dementia and Dementia Friendly Hospitals

The previous section briefly outlined the evidence based approach evolving in relation to healthcare and hospital design. Within this overall context an approach to dementia friendly design has developed that initially concentrated on long term care settings, but which has more recently extended to hospital settings.

In relation to long term residential care settings, Marshall (1998b) summarises a consensus on the design principles that need to be considered when designing these residential care facilities for people with dementia. She argues that design should: (i) compensate for the disability of dementia; (ii) maximise independence; (iii) enhance self-esteem and confidence; (iv) be orientating and understandable; (v) reinforce personal identity; (vi) welcome relatives and the local community; and (vii) allow control of stimuli.

To achieve these design principles Marshall outlines the following design features:

- Small size.
- Familiar, domestic and homely in style.
- Scope for ordinary activities.
- Unobtrusive concern for safety.
- Different rooms for different functions.
- Age appropriate furniture and fittings.
- Safe outside space.
- Single rooms big enough for lots of personal belongings.
- Good signage and multiple cues (sight, sound, smell etc.).
- Use of objects rather than colour for orientation.
- Enhancement of visual access.
- Controlled stimuli, especially noise.

While the above relate to long term residential care settings, these design principles and features have influenced the design of dementia friendly hospitals. This issue has been the focus of the King's Fund Enhanced Healing Environment (EHE) Programme which has been

running since 2000 and has involved over 230 health care providers in England (Waller et al., 2013). Improving the experience of people with dementia in hospitals has been one of the focus areas of this programme. Authors of the 2013 EHE report state that

“[i]n the case of dementia, there is increasing evidence that the environment of care in hospitals can have a significant and detrimental effect on patients with cognitive problems and dementia, leading to additional distress and confusion” (Waller et al 2013.p.7).

In response to this situation the EHE Programme has developed a set of overarching design principles with the aim of improving patient and staff outcomes including: easing decision-making; reducing agitation and distress; encouraging independence and social interaction; promoting safety; and, enabling activities of daily living. To achieve these outcomes the programme promotes the following design principles:

- Legibility (the ability to understand spaces).
- Orientation.
- Wayfinding.
- Familiarity.
- Meaningful activity.

In addition to these design principles, the EHE programme has developed a number of ‘Enhanced Healing Environment Assessment Tools’ for various settings, including a tool to assess dementia friendly design in hospitals (The King's Fund, 2014b). This tool contains a range of key questions structured around seven themes which examine how the environment promotes:

- Meaningful interaction between patients, their families and staff.
- Well-being.
- Encourages active engagement of people with dementia in their care.
- Mobility.
- Orientation.
- Calm, safety and security.

The various dementia friendly hospital design issues and guidelines that have emerged over the last few years are discussed in greater detail in Section 3.5 as part of the Literature Review.

## 2.7. Universal Design

An acute care public hospital will typically contain various facilities, from emergency departments and acute medical units, to inpatient wards and outpatient clinics, catering to a wide range of patients. In addition, acute hospitals are staffed by a high number of medical, clinical, allied health professionals, catering, facilities management, and building maintenance personnel. Therefore, while this current research advocates for a dementia friendly approach, it also acknowledges that the built environment in hospital must support people across the age spectrum with diverse needs, abilities and disabilities. In this regard the Universal Design approach is employed as a framework to ensure that the diverse needs and preferences of all stakeholders within the acute hospital setting are factored into this project.

The term Universal Design was established by Mace (1998) to refer to “the design of products and environments to be usable by all people, to the greatest extent possible, within the need for adaptation or specialist design”. In Ireland, the Centre for Excellence in Universal Design (henceforth referred to as CEUD) at the National Disability Authority (henceforth referred to as NDA) refers to Universal Design as “the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of age, size, ability or disability”.<sup>4</sup>

Universal Design is not only about removing barriers but also about creating the supportive conditions for social inclusion across all human abilities. Human abilities, as defined by CEN –CENELEC (2002) include: physical abilities, sensory abilities, and mental abilities, and these vary from person to person and change as a person gets older. Sanford (2012) also discusses human abilities, breaking these down in a similar manner except describing abilities as: motor abilities (similar to physical abilities), sensation and perception abilities (in part similar to sensory abilities), mental abilities (as above), and communication abilities. The inclusion of

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<sup>4</sup> The definition adopted by the CEUD draws on the Disability Act 2005, which defines Universal Design as meaning: “the design and composition of an environment so that it may be accessed, understood and used to the greatest extent possible, in the most independent and natural manner possible, in the widest possible range of situations, and without the need for adaptation, modification, assistive devices or specialised solutions, by persons of any age or size or having any particular physical, sensory, mental health or intellectual ability or disability.”

perception above takes account of how sensory information is perceived or processed, not just received, which is significant in terms of dementia. The addition of communication abilities is also relevant in the context of dementia and here Sanford includes speaking, writing, reading, listening, conversing, using social cues and regulating emotions, along with other similar communication abilities. Specifically:

“Universal Design is intended to engender both positive activity and participation outcomes by focusing on all abilities of all individuals rather than on people with disabilities alone. As a result, Universal Design is not just about access for some, but it is about usability and inclusion for all”(Sanford, 2012.p.xiii).

## 2.7.1 Universal Design Principles and Goals

Universal Design moves beyond the issue of physical accessibility and promotes an integrated approach which is reflected in the internationally established Universal Design principles (Kose et al., 2001, Preiser and Smith, 2011) as set out below:

- Equitable Use – the design is useful and marketable to people with diverse abilities.
- Flexibility in Use – the design accommodates a wide range of individual preferences and abilities.
- Simple and intuitive – the design is easy to understand regardless of the user’s knowledge, language skills or current concentration levels.
- Perceptible Information – the design communicates necessary information effectively to the user, regardless of ambient conditions of the user’s sensory abilities.
- Tolerance for Error- the design minimizes hazards and the adverse consequences of accidental or unintended actions.
- Low Physical Effort – the design can be used efficiently and comfortably with minimum fatigue.
- Size and Space for Approach and Use- design provides appropriate size and space for reach and manipulation, regardless of user’s body size posture or mobility.

More recently, Steinfeld and Maisel (2012) have developed a set of Universal Design goals to clarify the purpose of the Universal Design principles. These relate to human performance, health / wellness and social participation and are composed of the following:

- Body fit - accommodating a wide a range of body sizes and abilities.
- Comfort - keeping demands within desirable limits of strength and stamina.
- Awareness – insuring that critical information for use is easily perceived.
- Understanding – making methods of operation and use intuitive, clear and unambiguous.
- Wellness – contributing to health promotion, avoidance of disease and prevention of injury.
- Social integration – treating all groups with dignity and respect.
- Personalization – incorporating opportunities for choice and the expression of individual preferences.
- Cultural appropriateness – respecting and reinforcing positive cultural values and local context.

These design goals are useful in the context of dementia friendly design and help to frame the role of the built environment in terms of facilitating the needs of people with dementia, while also supporting their family and caregivers.

### **2.7.2. Universal Design and Urban Planning**

To facilitate the appropriate levels of accessibility, usability and inclusion, a facility such as a hospital must be considered not only in terms of the immediate building, but also in terms of its location and access for all users. In Ireland, Booklet 9 ‘Planning and Policy’, of the ‘Building for Everyone’ series, produced by the NDA’s CEUD argues for the inclusion of Universal Design at every level of planning in (CEUD, 2014b). Specifically:

“Universal Design is not just about access to individual buildings, it is about how easily people can get around and to where they want to go. Key factors in creating an accessible environment are the location of services and of good transport links. Safe routes between key places that are designed to be easy to use by all individuals are another essential feature” (p27).

The NDA’s CEUD introduces the concept of ‘Travel Chain Analysis’ to ensure that a person’s journey from their home to any facility is fully considered to eliminate barriers along the way that may hinder a person from reaching their destination in a safe and comfortable manner. In this context the physical environment should be examined at a

number of spatial scales from the macro urban scale, down to the micro scale of individual spaces and components within a building.

Iwarsson and Stahl (2003) examine the dimensions of accessibility and the spatial levels of the home, neighbourhood, and community by using the terms micro, meso, and macro levels of accessibility. Firstly, the micro level refers to the immediate physical environment and includes housing, and the immediate physical surroundings; secondly, the meso level of accessibility operates at the neighbourhood level and includes public space and other public facilities, such as public transport; and thirdly, the macro level describes society, at either a national level or an international level. Audirac (Audirac, 2008) continues this spatial analysis of UD and uses the same micro/meso/ macro framework, except that in this version the macro level remains as a specifically spatial quality.

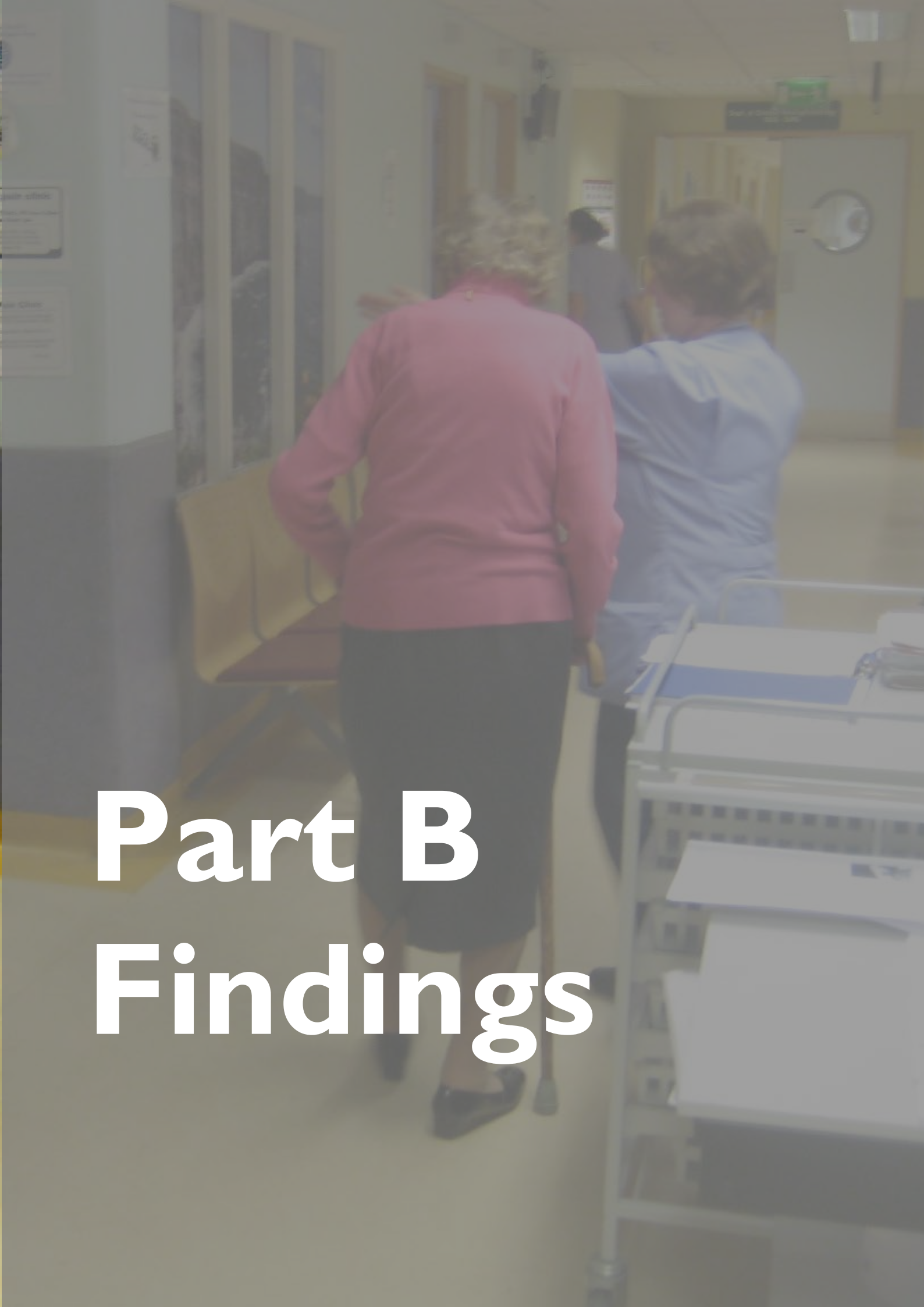
This spatial breakdown aligns with the Universal Design approach outlined above and is used in this research to structure both the literature review and the key findings.

## **2.8. Conclusion**

The previous sections outlined some of the main issues around designing for people with dementia, and the challenges that the typical hospital environment may present for these people, along with their family members or carers. The role of the built environment of the hospital in supporting therapeutic outcomes and patient well-being was highlighted along with some key international initiatives aimed at making the hospital setting more supportive for people with dementia. It was also acknowledged that the typical hospital must cater to a wide range of public users and hospital staff who will represent the full spectrum of ages, abilities, disabilities and needs, and therefore it is proposed to adopt Universal Design approach to ensure that the built environment is supportive of all patients, visitors and staff who use the hospital.

With this context in mind the following section investigates the literature, a number of exemplars and some case studies to help inform this research.





# Part B Findings

## 3. Literature Review

The background material outlined previously in Chapter 2 identifies some of the main hospital design issues in relation to human centred and dementia friendly hospitals. With the above overview in mind this current chapter seeks to examine the literature specifically in relation to dementia friendly hospital design. The review aim and objectives, research questions and review methodology are now described in detail below.

### 3.1. Literature Review Objectives

**Primary Objective:** 1) Determine the key dementia friendly design issues that have emerged over the last few years; and, 2) Assess the impact of various hospital planning and design approaches and interventions on the well-being of patients with dementia.

**Secondary Objective:** 1) Examine how hospital design can assist family members and carers in their supporting role while accompanying the person with dementia; and, 2) Identify gaps in the evidence and outline topics for future research.

### 3.2. Scope of the Review

Firstly, this review looks at key dementia friendly design issues in the hospital, and while the hospital setting is the focus of this review, design issues regarding other relevant healthcare environments (such as long term residential care) will also be examined.

Secondly, the review will examine a range of planning and design approaches and interventions that are recommended or have been implemented to improve the hospital setting. Given the complexity of the hospital environment and the need to ensure that all key locations and building components are considered, the spatial framework of macro, meso and micro levels as previously outlined will be used to structure the review of the various studies:

- Site Location, Approach, Site Entry
- Campus Design and Onsite Circulation – planning and design interventions to improve accessibility, usability, and orientation for people with dementia and also provide greater support for carers (i.e. appropriate exterior circulation routes, external wayfinding, respite or resting areas etc.)

- Building Entry and Internal Circulation – interventions to improve ease of access, interior wayfinding and orientation, respite or rest areas, increased legibility through visual access, etc.
- Key Internal and External Spaces – planning and design interventions that position spaces in appropriate locations, create calm and legible spaces that support easy orientation etc.
- Building Components – fittings, finishes, signage, technology, artwork etc.
- Internal Environment – thermal comfort, acoustic, and lighting interventions that address the cognitive and physiological needs of people with dementia.

In line with Drahota et al (2012), these interventions will include: 1) ‘positive distracters’ that provide sensory stimulation (not as part of a therapy); 2) interventions that reduce environmental stressors; and 3) multi-faceted interventions that blend various interventions.

### **3.3. Literature Review Methodology**

Okoli and Schabram (2010) provide guidance in relation to systematic literature reviews that draws upon many established methodologies (Fink, 2005, Petticrew and Roberts, 2006, Rousseau et al., 2008). This guidance describes a rigorous process for conducting reviews in relation to information systems (IS) research. While this guide refers specifically to IS, it is useful in the context of dementia friendly design as it responds to various disciplines, incorporates both quantitative and qualitative approaches, and includes methodologies from design science. The authors set out eight main stages for a literature review which include: 1) Defining the purpose of the literature review; 2) Drafting the research question, review protocol and training (if required); 3) Searching for the literature; 4) Using a practical screen to select appropriate literature; 5) Conducting a quality appraisal to further refine the selection; 6) Data extraction to identify relevant information; 7) Synthesis of studies to bring together and analyse key information; and finally, 8) Writing the review as a report on the key findings from the literature review.

The literature review carried out for this report largely follows this approach. The first two stages namely, the purpose of the literature review (reframed here as the aims and objectives) and drafting the research question, have already been discussed in Section 3.2 and 3.3, while the other stages are briefly described below.

### 3.3.1 Searching for the Literature

In order to identify primary studies, reviews and guidance documents suitable for answering the key research questions, the strategy adopted involved searching for research evidence via diverse sources. These included:

- electronic databases and search engines.
- hand-searching of key journals.
- existing networks, relevant organisations and conferences.
- reference lists.

The computer-based search performed to identify literature published between 1980 and 2013, included searches of the following electronic databases: Science Direct, Scopus, and PubMed. Searching of key individual journals (e.g. Hospital Design, Universal Design, Dementia, Built Environment) was also undertaken. The review involved searches of Google, Google Scholar and other similar online search engines. It included a review of literature from the TCD and other online databases. Searches were made of publications from the following existing networks, research centres and other relevant organisations such as:

- Centre for Ageing, Neurosciences and the Humanities, Tallaght Hospital, Dublin.
- Dementia Services Information and Development Centre, St. James Hospital Dublin.
- Dementia Services and Development Centre, University of Stirling.
- The King's Fund - EHE Dementia Care Programme.
- The Association for Dementia Studies (ADS), University of Worcester.
- Bradford Dementia Group.
- Royal Institute of Architects of Ireland.
- Royal Institute of British Architects.

The search was supplemented by manual searching of reference lists in the publications identified.

The key search terms used for the initial literature search included:

- Dementia and Hospitals.

- Carers of People with Dementia and Hospitals.
- Dementia Friendly Hospitals.
- Dementia Friendly Hospital Architecture.
- Dementia Friendly Hospital Design.
- Dementia Friendly Healthcare Buildings.

These searches were carried out on material between 1980 and present, and using advanced search facilities to conduct Boolean searches (i.e. dementia friendly AND hospitals) using the search field Abstract, Title, Keywords. The searches included all publication types and referred to all sciences or disciplines.

### **3.3.2 Practical Screen, Quality Appraisal, and Data Extraction**

The initial literature has been selected based on a number of criteria including: the experience of people with dementia and their carers in the hospital environments; dementia friendly hospital design; Universal Design of hospitals, or dementia friendly design of other healthcare environments where this is sufficiently appropriate to the current study. This literature is both peer reviewed and grey literature such as design policy and guidelines. Secondly, the literature selected was in English, thirdly, it was dated between 1980 and 2016, and finally the literature was drawn from a wide range of countries to ensure a balanced international representation.

Having selected a wide range of literature a quality appraisal was conducted to exclude literature that did not meet certain quality criteria including: 1) Was the material evidence based? 2) Was it peer reviewed? 3) Was the evidence based on primary data gathering? 4) Was the research methodology based on site specific studies? and, 5) In relation to guidelines, policy or other non-peer reviewed material, was the material supported by a government agency or recognised private or public body?

These five criteria formed the basis of a scoring form or template and only sources of literature that achieved at least 3 of these criteria was taken forward for further analysis as part of the data extraction phase.

A data extraction form or pro-forma template was prepared to collect key data and findings from the final selection of materials including: title; author and date (as an Endnote

reference); geographic location; document focus/research objectives; research methodology; context and study subjects; key findings and outcomes; and finally, conclusions.

### **3.3.3 Synthesis of the Literature and Writing the Review**

The data extracted was firstly organised as findings into categories, secondly these findings were analysed within each of these categories, and finally the findings were synthesised across the literature reviewed. Information from the above stages were distilled and presented in the discussion of the key findings from the literature as set out in the sections below. Section 3.5 discusses the findings relating to the key dementia friendly hospital design issues that have emerged from the literature, while Section 3.6 outlines the key findings regarding specific design approaches and interventions at various scales within the hospital environment.

### 3.4. Dementia Friendly Design Issues: Key Findings

Based on the approach outlined earlier, the research team has examined the guidance literature and investigated best practice to identify a range of **Key Guiding Dementia Friendly Design Issues** that are important in the hospital context. This review included well-established literature in relation to a wide range of healthcare environments (Calkins et al., 2001, Cohen and Weisman, 1991, Fleming and Bennett, 2014, Marshall, 1998a), relevant guidelines around dementia friendly design in the care home and domestic setting (DSDC., 2013, Pierce et al., 2014, van Hoof and O'Brien, 2014, Lawton, 2001), and recent guidelines around dementia friendly hospital design (Department of Health (UK), 2015, DSDC, 2012, Takeda et al., 2010, The King's Fund, 2014a). These key design issues have been examined, merged and grouped into six themes including: A) Supporting engagement and participation; B) Provide a people-friendly environment; C) Balance sensory stimulation; D) Support orientation and navigation; E) Provide adequate space to support the specific needs of a person with dementia; F) Appropriate use of technology. These are discussed in detail below.

#### Support engagement and participation



This theme is very much about aligning with and supporting a patient-centred approach within the hospital. Therefore, it is worth examining the term ‘patient-centred’ in a little more detail to understand the potential outcomes and consequences in the context of dementia friendly design.

Epstein and Street (2011) describe patient-centred care as:

“...based on deep respect for patients as unique living beings, and the obligation to care for them on their terms. Thus, patients are known as persons in context of their own social worlds, listened to, informed, respected, and involved in their care—and their wishes are honored (but not mindlessly enacted) during their health care journey.”

Dismissing the idea that patient-centred care may contradict an evidence based approach, they state that:

“proponents of evidence-based medicine now accept that a good outcome must be defined in terms of what is meaningful and valuable to the individual patient. Patient-centred care, as does evidence-based medicine, considers both the art of generalizations and the science of particulars.”



This definition of patient-centred care is useful in terms of some key dementia friendly design issues. The reference to the patient's 'social world' is relevant to engagement with family and friends; while a focus on listening to, and involving the patient in their own care has implications for participatory design, particularly for a person with dementia whose agency is often undervalued (Boyle, 2014).

## **1. Promote engagement with friends and family, staff and community**

Engagement with friends and family, staff and community is a multi-faceted issue that spans a number of spatial scales. At the macro and meso level the hospital must be located and sufficiently accessible to ensure family or friends can visit to provide the engagement required. According to Fleming and Bennett (2014), it is important to:

“Provide links to the community: Without constant reminders of who they were and are, a person with dementia will lose their sense of identity. The best people to remind them are their family and friends. The environment should therefore provide comfortable opportunities for visitors to spend time interacting with the patient.”

Participating in meaningful activities (To be discussed in Issue 8 below) is an important to maintain functioning during a hospital stay. Many of these activities are based on interactions with family, visitor, or staff, and often require a physical space in which to occur (this is discussed in issues 11, 15, 16 and 17 below).

## **2. Provide space and supports so that accompanying persons can remain with the person with dementia, where possible, throughout their time in the hospital.**

The support of a partner, family member, friend, or carer that might accompany a person with dementia as they visit or are admitted to the hospital is crucial for many people with dementia. An accompanying person can physically help the patient and also ease the hospital experience for a person with dementia by “being physically present, providing familiar voices and items, and maintaining usual family routines and life patterns in the hospital” (Li et al., 2003). Secondly the accompanying person can provide valuable information to the staff regarding the patient's needs, preferences and usual behaviour patterns and thus contribute to individualise care plans (Moyle et al., 2008). At the same time however, the accompanying role can also be stressful and demanding (Digby and Bloomer, 2014, Li et al., 2003, Moyle et

al., 2008) and therefore, it is important to support the accompanying person for the benefit of all.

### **3. Promote a participatory design approach: all key stakeholders contributing in a meaningful way to ensure their needs and preferences are incorporated into the design process**

All key stakeholders should contribute in a meaningful way to the design process to ensure their needs and preferences are incorporated into the design, delivery and management of the physical hospital environment.

In the first place, the design of an inclusive environment is predicated upon an understanding of the needs and preferences of those who will occupy it. In this regard, Steinfeld and Maisel (2012) contend that design participation needs to be a critical part of Universal Design, and they suggest that efforts should be made in every design project to include representatives of end users. This is of particular relevance to people with dementia who are often not consulted directly about their needs (Blackman et al., 2003).

Secondly, participation is also vital in achieving patient and family centred healthcare (Frampton et al., 2013, Douglas and Douglas, 2004), and according to Health Building Note 08-02 (Department of Health (UK), 2015), contributes to design projects by: ensuring and demonstrating that the needs of key stakeholders have been accounted for; helping to achieve buy-in and create a sense of ownership; enabling early engagement of appropriate expertise; and, by facilitating knowledge exchange.

The ideal of empowerment is at the heart of participatory design (Sanders and Stappers, 2008, Ertner et al., 2010), and empowerment through participation has been identified as an important contributor to the improvement of healthcare design (Donetto et al., 2015). More importantly, patient empowerment has been shown to improve health outcomes and encourage more efficient use of services (Selman et al., Koelen and Lindstrom, Barr et al.). For these reasons it is important to consider not only how participatory design can inform the design process, but also how participation can support patient empowerment as part of a patient-centred approach.

## Provide a people-centred environment



This theme is closely related to the patient-centred focus described in the previous theme – ‘Support engagement and participation’. The term ‘people-centred’ is used in healthcare (WHO, 2018) and design (Frascara, 2003) to describe a philosophy that seeks to understand the physical, psychological and social characteristics of humans, and put their needs and preferences first. In the context of hospital design, people-centred design recognises these characteristics and tries to create a more humane environment that responds to the human perspective and lived experience of people using the hospital.

### 4. Soften the institutional environment: more human-scale, less clinical or austere in appearance.

While the creation of a less institutional appearance in a dementia friendly environment is typically applied to the residential care environment (Marshall, 1998b, Calkins et al., 2001, Cohen and Weisman, 1991), it is increasingly becoming an issue in the hospital context where the focus is on creating a less clinical and more human scale environment (Verderber, 2010, Verderber and Fine, 2000). Fleming and Bennett (2014) argue that:

“The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The experience of scale is determined by three factors; the number of people that the person encounters, the overall size of the building and the size of the individual components, such as doors, rooms and corridors. A person should not be intimidated by the size of the surroundings or confronted with a multitude of interactions and choices. Rather the scale should help the person feel in control.”

This approach is also advocated elsewhere in the literature (Waller et al., 2013) where a “non-institutional scale and environment” is promoted.

### 5. Familiar design: recognisable design that is easily understood and intuitive to use.

As outlined in Section 2.2, many people with dementia will experience memory loss and an inability to recognise certain objects (2001), this is often compounded by a reduced capacity to learn new things (Marshall, 1998b). Therefore, dementia friendly design guidance will often promote design features and objects that are familiar to a person from his/her earlier life so that they will be more easily understood and used if memory becomes impaired. In

this regard, familiarity is often interpreted literally as a design approach or objects that are ‘homelike’ or represent an earlier era. However, familiarity in this way will often be difficult to achieve in the hospital context and consequently it is important to investigate what underpins familiarity so that it might be accomplished in a subtler way in a clinical setting.

Calkins et al (2001) argue that the Universal Design principle ‘Simple and intuitive’ (Mace 1998) promotes design that meets users’ expectations and thus in some ways supports the principle of familiarity. Maki and Topo (2009) examine Universal Design principles in the context of design for people living with dementia and they propose that the ‘Simple and Intuitive’ principle eliminates unnecessary complexity where use is easily understood regardless of the users’ knowledge, experience, language skill or current concentration levels. This also supports users with dementia and they state that:

“[f]or those with memory problems or dementia it implies that the use of the product needs minimal or no learning and that it reminds about previous products or previous experiences enough to avoid confusion and stress, and to help in using long term memory” (p. 64).

Maki and Topo make an interesting point in relation to design that reminds a user about previous products or previous experiences. The subtle but important distinction is made between the literal meaning of familiarity, where something must be immediately familiar, and the subtler meaning that familiarity might also occur when something simply ‘reminds’ a person of a previous experience. The concept of ‘affordance’ is also relevant here. Norman (2002) describes the theory of affordance as the relationship between a physical object and a person:

“...a relationship between the properties of an object and the capabilities of the agent that determine just how the object could possibly be used.....the presence of the affordance is jointly determined by the qualities of the object and the abilities of the agent that is interacting” (ibid p 11) ...Affordances exist even if they are not visible. For designers, their visibility is critical: visible affordances provide strong cues to the operation of things. A flat plate mounted on a door affords pushing. Knobs afford turning, pushing and pulling. Slots are for inserting things into. Balls are for throwing or bouncing” (ibid p 13).

In light of the possible invisibility of an affordance, Norman (2013) points to the need for ‘signifiers’ to ‘signal things’, or to communicate what actions are possible or how something can be used.

As described by Norman, affordances are dependent on a person’s abilities, and this may be an issue for people living with dementia. However, if design builds in affordances and

signifiers to the greatest extent possible and reinforces this by using shapes, colours, textures, smells, or other perceptible characteristics that remind people of previous experiences, then the possibility that people living with dementia will understand how best to use the item may be improved.

## **6. Facilitate personalisation: provide opportunities to add personal belongings such as photos to reinforce identity and help with orientation.**

Reinforcing personal identity or the continuity of self is regarded as an important goal in designing for people living with dementia (Lawton, 2001, Marshall, 1998b). Calkins et al (2001) argue that objects that are meaningful to a person can support their well-being and address the therapeutic goals of awareness, orientation, continuity of self and control.

While the principle of personalisation often refers to the residential care setting, there is also a role for it in the hospital setting. As discussed previously, the hospital can be a disorientating and challenging environment for a person with dementia and therefore anything that enhances orientation or reinforces personal identity would be helpful.

## **Support patient safety, wellbeing & health**



## **7. Provide a safe environment: unobtrusive safety measures that do not conflict with other issues such as privacy or the freedom to engage in physical activities.**

The creation of a safe environment is central to most dementia friendly design, however this should involve unobtrusive safety measures that do not conflict with other issues such as privacy or the freedom to engage in physical activities (Fleming and Bennett, 2014, Marshall, 1998a).

## **8. Support diet, nutrition and hydration: calm, accessible and usable spaces, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite.**

This is a principle put forward by the Health Building Note 08-02 (Department of Health (UK), 2015) and reiterated by the King's Fund's Enhancing the Healing Environment Programme where one of the assessment criteria is an environment that encourages eating

and drinking (The King's Fund, 2014a). This design issue is supported by calm, accessible and usable spaces, with appropriate lighting, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite (Calkins et al., 2001, Timlin and Rysenbry, 2010).

## 9. Support meaningful activities: including physical, social, and activities of daily living (ADLs)

The importance of an environment that enables physical, social, and activities of daily living (ADLs) is emphasised in much dementia friendly design research. For example, Lawton (2001) Marshall (1998b), and Calkins et al (2001) all call for an environment that supports ordinary activities that are meaningful to the person. In the hospital context this design issue is advocated by the King's Fund (Waller et al., 2013) and promoted by Fleming and Bennett (2014), and in the Health Building Note 08-02 (Department of Health (UK), 2015), where it is seen as a crucial component to keeping patients active and engaged (See Issue 11 regarding outdoor space for information about outdoor activities).

## Balance sensory stimulation



### 10. Optimise positive sensory stimulation (i.e. sunlight, music, artwork, images of nature etc.) while minimising negative stimulation (i.e. noise, glare etc.) as part of a calming and therapeutic approach.

**Natural Light:** Reviews of the research literature, such as Ulrich et al (2008), identify the therapeutic value of providing patient rooms with good levels of natural light and views to nature. The positive therapeutic impact of sunlight exposure has been shown in relation to decreased stress, pain, and analgesic medication use (Walch et al.), while improved sleep/wake patterns through boosted circadian rhythms has also been connected to daylight in hospital rooms (BaHammam). There is also a correlation between daylight exposure and reduced depression and mortality rates in acute settings (Benedetti et al., 2001, Beauchemin and Hays, 1998). While the above considerations are also important for all people, there is additional significance for people with dementia who may often suffer from sleep

disturbance (Tsapanou et al., 2015), and increased agitation levels (Fleming and Bennett, 2014). With regards to these, research shows how exposure to light strengthens circadian rhythms and thus improves sleep (van Hoof et al., 2010), while exposure to morning bright light can alleviate symptoms of agitation (Ancoli-Israel et al., 2003).

Torrington and Tregenza (2007) refer to the temporal orientation value of natural light, stating that a person moving through a building can “orient themselves according to time of day and season of the year based on sun angle in the sky and quality of the light visible from views out of the building.” (p.90). According to these authors, natural light, particularly sunlight, also plays a spatial orientation role by providing different light qualities in different parts of the building according to orientation and therefore helping people with dementia to differentiate between spaces that may otherwise appear very similar. (The importance of natural light will also be discussed in relation to Biophilic Design)

**Views:** Regarding views to nature, Ulrich et al (2008) describe studies where views of nature from both non-healthcare and healthcare environments (e.g. patient rooms) have been shown to reduce pain, stress, and length of stay, while also offering restorative effects such as positive emotional, psychological, and physiological changes. Of course, these benefits are applicable to all people, however, for many people with dementia whose mobility or ability to go outside independently, external views may be one of the few ways they have to experience the outdoors and contact with nature (Gibson et al., 2007).

Furthermore, it has been observed that that the presence of windows with a view can enhance social interactions since people tend to group in seats around an attractive window and the view itself provides an easy opening for conversation, while views of everyday activities of people outside, are attractive to those who are confined indoors (Torrington and Tregenza, 2007). Torrington and Tregenza also outline the spatial orientation benefits of an external view as people can use familiar external landmarks to orientate themselves within a building (ibid). (The importance of views will also be discussed in relation to Biophilic Design)

**Music or artwork:** Other positive sensory stimuli such as music (Moss et al.) or artwork (Behrman, 1997, Moss and O'Neill, 2014) is advocated in the clinical setting to provide a calming effect and to support meaningful activity, orientation and wayfinding (Waller et al., 2013).



**Noise, glare, reflections and disorientating visual patterns:** Negative sensory stimulation is a major concern for people with dementia. Noise will disrupt sleep and can adversely affect a person's physiology as, for example, raising blood pressure (Bluyssen, 2009). For people with dementia noise is a major problem, emphasised by Judd who states that "noise to people with dementia is like stairs to people in wheelchairs" (1998,p17). According to Bakker (2003):

“[p]eople with dementia may have normal hearing, but they can lose the ability to interpret what they hear accurately. Underlying hearing disorders can also predispose a person to auditory hallucinations ...Excess noise can result in confusion, overstimulation, and difficulty communicating” (p.48).

Due to symptoms such as agnosia or the behavioural and psychological symptoms of dementia, a person with dementia may experience visual spatial cognition difficulties that lead to problems with depth perception, disorientation, anxiety or discomfort (see Issue 12 for more information about spatial cognition and orientation).

In this context, glare and reflections from colour can cause visual discomfort and diminish visual perception thus potentially causing disorientation for a person with dementia (Bakker, 2003, DSDC, 2012, Torrington and Tregenza, 2007). Reflections from glossy surfaces may also be problematic if they are perceived as water, for instance, a light reflection from a glossy floor can be misinterpreted as being wet and slippery, and consequently may cause a person with dementia to alter their gait or step over the perceived wet patch, possibly resulting in a fall (DSDC Stirling, 2010).

Furthermore, significant contrasts in floor colour tones can be perceived as a step or hole by a person living with dementia (Calkin, 2010). Similarly blocks of contrasting colour tone or high contrasting floor patterns may be perceived as objects on the floor, that result in stepping over (DSDC Stirling, 2010), sidestepping, or veering (Perritt, McCune and McCune, 2005). Floor coverings that represent real life objects can also be problematic in line with the issues above.

Finally, according to studies by Cohen-Mansfield et al, wall coverings with repetitive patterns or images/graphics depicting real life objects such as plants can cause fear, restlessness, frustration, confusion (Cohen-Mansfield et al., 1990). It is not hard to imagine that trying to pick non-existent flowers or leaves off a wall would cause frustration.

## 11. Provide contact with nature and access to outdoor space to support active and passive therapeutic activities.

**Contact with nature and Biophilic Design:** Biophilia, a term initially introduced by Erich Fromm (Fromm, 1973), is described by Wilson (WILSON, 1984) “innate tendency to focus on life and lifelike processes,” and “the innately emotional affiliation of human beings to other living organisms” (Wilson, 1995). Beyond this affiliation, it is argued that contact with natural processes and organisms has important consequences for humans, and that fulfilment of this biophilic relationship influences our health and well-being (Kellert, 2012).

Other constructs such as the Gensler’s concept of Therapeutic Landscapes (1992), or Kaplan and Kaplan’s Attention Restoration Theory (1989) align with biophilia to provide solid theoretical underpinnings connecting human health and contact with nature.

While research is still needed in this area, significant evidence such as Ulrich et al (2008) and others (Frumkin, 2001, Barbara J. Huelat, 2008, Grinde and Patil, 2009) have found positive links between health and nature. In a wide ranging review Kuo (2015) identifies 21 “plausible causal pathways from nature to health” including “environmental factors, physiological and psychological states, and behaviors or conditions”(p2). Kuo concludes that there is strong link between exposure or engagement with health, while stressing the importance of ‘everyday’ nature and the creation of green oases:

“especially trees, soil, and water (preferably moving) — and should be designed to induce feelings of deep relaxation, awe, and vitality. Providing these green oases, especially in areas where health risks are high and landscaping is sparse, might be an inexpensive, powerful public health intervention and address persisting health inequalities.” (p6)

In relation to dementia, contact with nature has been shown to provide many physical and psychosocial benefits. The concept of green care, that today is being used more frequently in dementia, is one such approach. Haubenhofner (Haubenhofner et al., 2010) describes green care as:

“...a broad spectrum of health-promoting interventions that all use both biotic and abiotic elements of nature in their treatments. The ultimate goal is to maintain or promote a person’s social, physical, mental, and even educational well-being.

Initial studies in care homes are revealing the potential benefits of green care for people with dementia including increased physical activity, engagement, and social interaction (de Boer et al., 2017).

In the context of the healthful and therapeutic impact of nature, biophilic design is the translation or application of biophilia into the design of the built environment. There are two key dimensions to biophilic design, the first is the “organic or naturalistic dimension, defined as shapes and forms in the built environment that directly, indirectly, or symbolically reflect the inherent human affinity for nature”. While the second relates to “a place-based dimension, defined as buildings and landscapes that connect to the culture and ecology of a locality or geographic area” (Kellert et al., 2011).

According to Kellert (2011) these two dimensions of biophilic design unfold through to six “biophilic design elements” including:

- Environmental features: i.e. colours associated with natural phenomena; water; natural ventilation; sunlight; plants; animals; natural materials; views and vistas; geology and landscape; or fire.
- Natural shapes and forms: i.e. botanical motifs; tree and columnar supports; animal motifs; biomorphy; or geomorphology.
- Natural patterns and processes: i.e. sensory variability; information richness; age, change and patina of time; growth and efflorescence; patterned wholes; transitional spaces; or fractals.
- Light and space: i.e. natural light; filtered and diffused light; light and shadow; warm light; spatial variability; or inside-outside-spaces.
- Place-based relationships: geographic connection to place; historic connection to place; cultural connection to place; indigenous materials; or avoiding placelessness.
- Evolved human-nature relationships: i.e. prospect and refuge; order and complexity; attraction and beauty; information and cognition; or reverence and spirituality.

Evidence is still required to support many of these design elements, particularly in the hospital setting, and some elements, such as information richness or light and shadow, would need careful handling in terms of dementia friendly design. However, other elements, for instance, sensory variability or place-based relationships align with many of the dementia friendly design issues discussed in this section of the report.

Some of these elements, such as direct contact with environmental features such as plants or water, are often associated with outdoor spaces and gardens, these are discussed in the following section.

**Outdoor Space:** The benefits of views to nature have been discussed in Issue 10, while the importance of contact with nature has been explored in the context of biophilic design, however, direct access to outdoor spaces is an important feature for people with dementia. If a person with dementia is admitted to a hospital for an extended period of time, access to outdoor space is a crucial factor in relation to their health and wellbeing. If the space is readily accessible and safe, it makes it easier for people with dementia to go outdoors independently, to enjoy nature, socialise, or carry out gardening. All of these activities have been shown to be therapeutic for people with dementia and are therefore an important part of dementia friendly design. Specifically:

“there is a need for therapeutic gardens to be incorporated as a ‘standard’ complementary element in special care units for people with dementia. Such an inclusion directly impacts the quality of life for residents, staff and family members” (Hernandez, 2007).

However, while the healthful and therapeutic benefits of access to nature are receiving greater attention in healthcare settings, as discovered in this current research, many Irish hospitals do not take advantage of their campus and outdoor spaces in this regard. Evidence regarding the use of outdoor space in hospitals internationally is sparse, however, one study from Wroclaw in Poland that analysed 13 hospitals found that outdoor spaces were rarely used for green care or nature-based therapies and that these spaces were largely neglected or under resourced, in terms of outdoor seating, covered areas, or activity areas (Górska-Kłęk et al., 2013).

With the importance of outdoor space in mind, the following sections examine a number of key issues relating to the benefits and requirements of outdoor space for people with dementia.

**Outdoor space and change of scene:** Cohen and Weisman (1991) posit that outdoor spaces provide relief from the “dominant ambiance” of the main facility where they are reside (Pg.73). They argue that many intuitional facilities are perceived as confined and enclosed and can therefore cause agitation for people with dementia.

Studies by Rappe et al (2006) show a strong relationship between self-related health and frequent visits to external green spaces. In a later paper, Rappe and Topo (2007) argue that these findings align with previous studies which show a correlation between reduced stress level and a greater sense of control , and time spent in gardens within institutional settings

(Marcus and Barnes, 1995, Ulrich, 1999). In relation to the specific impact of exposure to plants, Rappe et al (2006) outline the following positive effects, namely:

“[p]lants provide sensory stimulation for all the senses through colours, structures, scents, tastes, forms and sometimes by sounds. Sensory stimulation is important for the elderly suffering from dementia since it can improve orientation, trigger memory, prevent emotional outbursts and facilitate connectedness in individuals with dementia (Rappe et al., 2006).

Outdoor space and Exposure to natural light: Time spent outdoors also increases exposure to natural daylight which helps to regulate circadian rhythms and sleep/wake patterns (Brawley, 2001). Research carried out in a number of facilities in the US by Calkins (2007) shows that increased exposure to natural light resulted in a 10% increase in ‘sleep efficiency’. Based on these results, and the fact that this intervention often has no cost implications, Calkins argues for further advances in this area.

Outdoor space as a ‘restorative’ environment in terms of attentional capacity: Moore (2007) states that recent neurological research identifies ‘executive function’ and ‘attention’ as two of the critical cognitive functions affected by Alzheimer’s Disease.

“Attention...is the cognitive ability to focus; to suppress extraneous stimuli and attend to that stimuli which is directly related to the task at hand. Classic dementia manifestations such as short attention spans, distractibility and impulsivity suggest on-going attentional impairment” (p.75)

In discussing how ‘restorative dementia gardens’ may support attention, Moore refers to Kaplan’s ‘Attention Restoration Theory’ (Kaplan, 1995) where it is argued that certain environments can help restore ‘attentional capacity’. Kaplan points to the following properties of a restorative environment:

“Being away: being distinct, either physically or conceptually, from the everyday environment;  
Fascination: containing patterns that hold one’s attention effortlessly;  
Extent: having scope and coherence that allow one to remain engaged; and  
Compatibility: fitting with and supporting what one wants or is inclined to do” (pg.482).

Examining five therapeutic dementia gardens in the US, Moore (2007) argues that garden environments can successfully provide these properties and therefore function as an attentional restorative environment for people with dementia.

Outdoor space and activities as general therapy: Outdoor spaces provide an opportunity to partake in typical outdoor activities such as gardening, which afford both passive and

interactive stimulation, and thus can be therapeutically beneficial (Gibson et al., 2007). Rappe and Topo (2007) discuss the value of gardening and horticultural activities, pointing out how these have been linked to a lower risk of dementia due the protective effect of such complex actions (Fabrigoule et al., 1995). These activities are also therapeutic for many older people due to: the familiarity of the associated tasks and the opportunities for reminiscing provided; and the cognitive stimulation provided by such complex tasks (Jarrott et al., 2002).

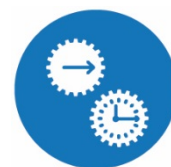
**Outdoor space and activities as physical exercise:** Many other outdoor activities such as lawn-mowing, raking leaves, hanging out clothes, or putting the rubbish or recycling out, will not only stimulate long-term memories of earlier home-life, but will keep people with dementia physically active. In this regard, research by Lindenmuth and Moose (1990) demonstrated that exercise could improve physiological and psychological processes and thus may improve the cognitive abilities of people with Alzheimer's disease.

**Outdoor space and socialising:** Finally, the use of outdoor space for socialising is also an important consideration for people with dementia. Rappe and Topo (2007) argue that natural spaces support socialisation in a number of ways: through their aggression reducing effect (Kuo and Sullivan, 2001); and positive impact of common green spaces on the social ties between older adults (Kweon et al., 1998). They refer to their own research which reports on one care home where visits by relatives, especially younger relatives, increased after the establishment of a garden. The authors also suggest that the calming environment of a garden makes social occasions less stressful, and attention is often drawn to aspects of the garden as opposed to individual behaviour.

While access, usability and the creation of interesting outdoor spaces is important, it is also important to consider how people transition between interior and exterior spaces. In this context edge spaces and sheltered external in-between spaces can allow a person 'preview' an activity that may be taking place outside before committing to involvement or participation. These transition spaces also allow a person's eye to adjust to outside lighting levels, or comport to a person who may be anxious about the weather conditions outside. Transition or edge spaces also provide conditions that support natural and social diversity and interactions and can therefore be exploited in dementia friendly design.

(Outdoor spaces and edge spaces will be dealt with in more detail in Section 3.5.5)

## Support orientation and navigation



### 12.Support orientation to date, time, location, etc. and improve spatial cognition.

Amnesia and agnosia (BURNS, 2001) are two common symptoms of dementia and these can often result in a person becoming disorientated in terms of time and place and therefore is a major component of dementia friendly design (Lawton, 2001, Marshall, 1998b) (Calkins et al., 2001, Cohen and Weisman, 1991, Fleming, 2011) (van Hoof and O'Brien, 2014, Pierce et al., 2015). For the hospitalised person, these challenges are often compounded by the size, busyness, and unfamiliarity of the hospital, coupled with unfamiliar people, changing staff, illness and medication. Consequently, the promotion of an environment that supports orientation is a key component in many of the guidelines with recommendations including: artwork to reflect seasons; calendars; large face clocks; natural light; access to outside spaces; photographs of local scenes; views of nature; and visible staff (Waller et al., 2008).

Orientation in space also depends on visual spatial cognition, which according to Possin “involves the perception, selection, organization, and utilization of location and object-based information, and provides a structure for how we interact with our physical environments” (Possin). In this way, visual spatial cognition influences how a person comprehends their environment. However, depending on the form of dementia, many people with dementia will experience spatial cognition difficulties including impairments to: spatial processing; angle discrimination and motion perception; perceptual discrimination; contrast sensitivity; navigation learning and spatial memory; and visual spatial construction. In addition people with dementia can also experience visual hallucinations and visual perceptual disturbance (Possin).

Spatial comprehension also depends on the legibility of a space (Lynch, 1960), recently described by Li and Kippel as ‘environmental legibility’ who defined it as “an indication of the ease with which environments (potentially) can be learned and understood by humans” (Li and Klippel, 2014). To alleviate some of the visual spatial cognition impairments outlined previously, the spatial environment should balance differentiation of appearance (size, shape, colour, or architectural style); visual access (the visibility of one part of a building or space from various locations); and layout complexity (i.e. level of spatial articulation, number of separate spaces etc.) to ensure the space is easily to comprehend and remember (Carlson et al., 2010, Montello, 2014).



### **I3. Provide good way-finding that supports navigation; this is linked to orientation but is largely about finding your way around or getting from one place to another.**

A person's ability to navigate within the physical environment is heavily influenced by their level of spatial orientation as discussed above, which in turn has an impact on their wayfinding abilities. Specifically:

“[t]he process of finding one's way includes knowing where you are, knowing your destination, knowing (and following) the best route to the destination, recognizing the destination upon arrival, and finding the way back” (Marquardt, 2011).

Wayfinding has been recognised as a problem in the healthcare environment, resulting in stress, feelings of helplessness, raised blood pressure, and fatigue (Carpman and Grant, 2001). Economic costs have also been identified through loss of productivity due to staff having to give directions or escorting visitors and patients to their destinations (Huelat, 2007, Zimring, 1990).

In addition to spatial orientation, wayfinding is “the problem-solving abilities necessary in reaching locations” (Passini et al., 1998) and is predicated on higher order and task decision making, decision execution, and information gathering. Taking into the account the symptoms of dementia as described by Marshall (1998b) including impaired memory, impaired reasoning and ability to learn, high levels of stress and an acute sensitivity to the social and built environment, the decision making process that underpins wayfinding is often undermined for people with dementia. Furthermore, these wayfinding challenges may be compounded in the busy, large-scale and complex environment of the hospital and exacerbate a person's level of anxiety (Royal College of Psychiatrists et al., 2013, DSDC, 2012).

To achieve better wayfinding for people with dementia in a complex environment such as a hospital, Passini et al (1998) point to the importance of a 'spatial organisation' with a simple layout, a configuration that minimises memory and inference-based decisions, and on that allows a person to move from one decision point to the next without too much forward planning. The spatial organisation should reduce dependence on cognitive mapping by providing good visual access and clearly communicating the overall structure of the space.

They also emphasise the role of ‘environmental communication’, which can be achieved by clearing articulating key features and functional zones, clearly expressing the circulation strategy, creating spaces with distinct character, introducing key landmarks, and at a more detailed level the use of graphic information.

These underpinning components of wayfinding in the hospital environment are clearly delineated by Huelat’s (2007) wayfinding ‘building block model’ that uses a hierarchy of layers or ‘building blocks’ to build up a good wayfinding system across the spatial scales of a hospital (i.e. from master plan to graphics and amenities) as follows:

- Master Plan: at a site plan level establish good circulation pathways and ensure that this legibility can be maintained with that future expansion.
- Architecture and Landscape: at a site level use landscape, planting, landmarks, and buildings for wayfinding.
- Interior Architecture: use architectural elements such as entrances, legible pathways, clearly visible vertical circulation such as lifts, internal landmarks, visual access, and visual cues at decision points.
- Interior Design: use lighting, colour, distinct materials to facilitate wayfinding.
- Signage: signage supports the previous ‘building blocks’ and is typically: 1) Informational (i.e. where to find assistance, opening hours etc.); 2) Directional; 3) Identifying (i.e. identifies a particular area or zone in the hospital); 4) Regulatory (i.e. radiation in use).
- Graphics: using symbols and wayfinding graphics to support and reinforce signage.
- Facility Amenity: the final ‘building block’ are the services provided by information desks visitor information centres within the hospital.

In addition, Huelat encourages the use of a facility map with clear graphics showing key locations, a north point and a you-are-here identifier. She also advocates for the use of user-friendly language.

Huelat also uses the concept of ‘progressive disclosure’ to underpin these building blocks. Progressive disclosure is a wayfinding approach often used in large building complexes such as airports, and is based upon providing the visitor with just enough information to get them to the next decision-making point (Huelat, 2007). This avoids information overload and confusion and helps to simplify the navigation of a building.

#### **I 4. Provide good visibility and visual access: Optimise lighting conditions and make sure important features (e.g. handrails), spaces (e.g. toilets), and people (e.g. staff) are clearly visible.**

The value of visual access in terms of orientation and wayfinding has already been discussed, however, visual access also plays a role in assisting people to locate objects or key spaces (Marshall, 1998b, Calkins et al., 2001) which may otherwise be difficult to find for the reasons previously discussed. Furthermore, in addition to simply seeing and locating an object, research has shown that some forms of dementia render it difficult for a person to form a mental visual image of an object or place if they cannot see it, which consequently undermines their ability to create, maintain and use cognitive maps (Marquardt and Schmiege, 2009).

In the hospital context visual access is promoted in the Health Building Note 08-02 (Department of Health (UK), 2015) and by Fleming and Bennett (Fleming and Bennett, 2014) who argue for visual access to the environment and also the visibility of people: “An environment that allows people to see their destination will help to minimise confusion. It should also enable staff to see the patient from where they spend most of their time. This assists with the monitoring of the patient and reassures the patient of their safety.”

## **Adequate space to support the needs of a person with dementia**



#### **I 5. Bays or single rooms with space for personal belongings and adequate room for visitors.**

While many hospital wards will contain a mixture of single-bed inpatient multiple bed inpatient rooms, the demand for single-bed rooms has increased due to societal expectations (Hussain and Babalghith, 2014) and research that shows the advantages of single rooms in terms of noise and infection control (Ulrich, 2006, Ulrich et al., 2008). According to van de Glind et al (2007), some studies regarding single rooms show moderate improvements in the patient environment, i.e. satisfaction with care, noise, quality of sleep, privacy and dignity. However, studies regarding hospital infection rates are inconclusive, while at the same time there is a dearth of data regarding patient recovery rates and safety in single rooms. They note that reliable data relating to positive or negative aspects of single-bed rooms is absent, and therefore conclude that issue remains up for debate.

As part of this debate, Verderber and others (Verderber, 2010, Verderber and Todd, 2012), advise against eliminating all multiple rooms, and suggests that a hybrid approach combining single and multiple rooms may be worth considering in existing and new build hospitals.

Possible benefits associated with multiple-bed rooms include greater patient safety (Singh et al., 2015, Ugboma et al., 2011) and social interaction (Malcolm, 2005, Verderber and Todd, 2012), while on the other hand single-bed rooms may increase building size and associated construction costs (Latimer et al., 2008, Verderber and Todd, 2012).

Despite this debate, the reality is that many hospitals will have a mixture of both single-bed and multiple-bed inpatient rooms, and in either case a dementia friendly approach will need to be considered.

### **16.Space for retreat in multi-bed wards (i.e. quiet sitting room for patients and family that can be used as respite from busy ward) and communal areas in single-bed wards to allow social interaction.**

The King's Fund recommend a calm environment within the hospital (The King's Fund, 2014a), and in addition Calkins et al (2001) advise that a secure retreat space helps a person to withdraw when they feel overwhelmed. In a multi-bed ward, given the nature of the space and activities, it will not always be possible to maintain calm, and therefore providing a retreat space or a space for one-to-one communication or activities will be beneficial (Andrews, 2013). This room, or another if space permits, may also serve as an overnight facility for an accompanying person if there is not enough space within the patient room (Andrews, 2013, DSDC, 2012).

Consideration should also be given to a day room for activities, dining, or engaging with visitors or other patients (Andrews, 2013, DSDC, 2012), this may be particularly important for patients in single rooms who may feel isolated.

### **17.Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes.**

The Royal College of Psychiatrists (2013) recommend that space and resources are important for patient activity, as they argue that inactivity can lead to a “lack of attention, lack of stimulation and boredom for patients”. In this regard many of the hospital design guidelines call for day rooms or adequate space within single and multi-bed patient rooms to support patient activity (The King's Fund, 2014a) (Department of Health (UK), 2015).

Certain behaviours exhibited by many people with dementia, labelled as challenging or inappropriate, have been defined as “inappropriate verbal, vocal, or motor activity that is not judged by an outside observer to be an obvious outcome of the needs or confusion of the individual” (Cohen-Mansfield and Billig, 1986). Rather than merely reacting to these behaviours, Cohen-Mansfield suggests a more proactive approach by understanding these behaviours as unmet needs or as an environmental vulnerability/reduced stress-threshold (Cohen-Mansfield, 2001). Both of these have implications for the built environment given that:

“An environmental vulnerability may make the person who suffers from dementia more susceptible to environmental antecedents and consequences. The environmental vulnerability may produce an unmet need when normal levels of stimulation are perceived as overstimulation”.

A review of various interventions to alleviate inappropriate behaviours conducted by Cohen-Mansfield (2001) reveals the following approaches:

- Sensory intervention (for stimulation or relaxation), including: music, massage/touch, white noise, and sensory stimulation.
- Social contact (real or simulated), including one-on-one interaction, pet visits, and simulated presence therapy and videos.
- Activities, including structured activities, outdoor walks, and physical activities.
- Environmental interventions, including wandering areas, natural or enhanced environments, and reduced-stimulation environments.

The provision of wandering areas and spaces to facilitate outdoor walks are largely aimed at reducing wandering or pacing behaviour, which estimated to occur in 15–60% of people with dementia (Robinson et al., 2007). In the hospital context providing safe walking spaces areas has been recognised in a number of guidelines (Royal College of Psychiatrists et al., 2013, The King's Fund, 2014b), with perhaps the most explicit recommendation coming from Fleming and Bennett (2014):

“Support movement and engagement - provision for wandering, circulation and access to outside area: Aimless wandering can be minimised by providing a well-defined pathway, free of obstacles and complex decision points, that guides people past points of interest and gives them opportunities to engage in activities or social interaction. The pathway should be both internal and external, providing an opportunity and reason to go outside when the weather permits.”

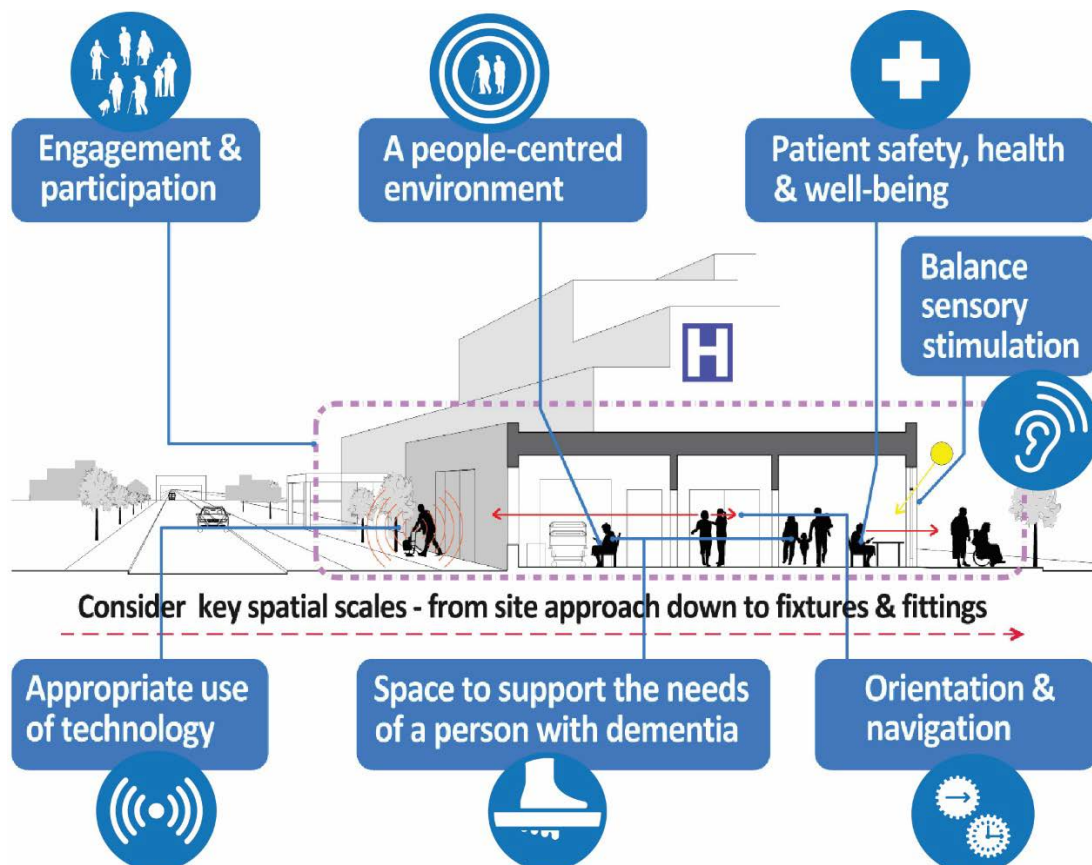
# Appropriate use of technology



## 18. Appropriate use of technology for care delivery, safety or therapy (i.e. sensory stimulation)

One of the main applications of technology for people with dementia is linked to patient observation or safety. Nowadays electronic monitoring equipment (Andrews, 2013) is available to ensure patients do not go beyond predetermined exit points, and to monitor movement within a hospital (Nugent and Augusto, 2006). Technology is also used in the prevention and monitoring of falls (Cameron et al., 2012).

Overall, in terms of technology and people with dementia, Orpwood (2009) warns that many solutions are technology led, rather than needs led. He argues for designers to have an in-depth knowledge about the issues that face users when they interact with a technology, but also how they might react to potential solutions. Due to the complexity of human behaviour and the manner in which people interact with technology, it is impossible for designers to work in isolation from the end user. However, given the challenges raised by involving people living with dementia in the design process, there is a need to employ sensitive and ethical approaches when working with them.



## 3.5. Design approaches & interventions at across principal spatial scales: Key Findings

### 3.5.1 Location

#### Hospital location and ease of access for hospital users

The location of hospitals and their integration with, or accessibility from the local community has been the subject of debate in recent times. Rosenbaum discusses how many hospitals in the US are becoming “health hubs” (Butler et al., 2015) and “intermediaries” (Singh and Butler, 2015) in terms of their integration with the local community. However, this development largely contrasts with the international trend that developed during the 20<sup>th</sup> century, which saw many hospitals restricting direct interaction between the public city and the physical hospital, or simply moving away from urban centres to suburban or greenfield sites (Prasad, 2012).

While a hospital relocation is often driven by a lack of land or high land costs in central urban locations, there are access implications for hospital users, and in particular for older people, and those living with dementia. Recent initiatives such as the World Health Organisation (WHO) Global Age Friendly Cities guidance (WHO, 2012) state that:

“[I]iving close to services and facilities is also seen as an age-friendly feature.... Having well-located, easily accessible health services is fundamentally important for older people...Services that are far away or difficult to reach are often seen as barriers.”

This WHO guidance also stresses the importance of age-friendly public transport that provides access for older people to key services such as hospitals and health centres. This concern is echoed in the Irish National Positive Ageing Strategy (Department of Health (IRL), 2013) where it is acknowledged that many older people may be unable to drive due to chronic disease or sensory impairments and therefore alternative modes of transport must be provided:

“For older non-drivers, the accessibility and affordability of different modes of transportation are essential factors to ensure that they can remain actively engaged in their communities. Inaccessible or unavailable transport (which can be common in rural areas) can have a detrimental effect on quality of life” (p27).

The location of any public facility such as a hospital influences the feasibility and availability of alternative modes of transport such as walking, cycling or public transport. Various



guidelines and policy internationally (BRE, 2012, BRE, 2014, Care, 2017, Institute, 2014) and in Ireland (DEHLG, 2009a, DEHLG, 2009b, DEHLG, 2013, Department for Communities and Local Government, 2007, Department of Transport, 2009) stress the advantages of compact, accessible and walkable communities where public healthcare services and facilities are within easy reach of the local community.

In this regard, and in the context of the hospital as a community ‘health hub’ (Butler et al., 2015), proximity and ease of access for the local community is critical. As stated by Irish National Positive Ageing Strategy, many older people may be unable to drive for various reasons, and while people with early dementia may be safe drivers, as the condition progresses the ability to safely drive a vehicle is eventually lost (Breen et al., 2007).

Considering that people aged 65 and older represent 20% of hospital attendances and up to 50% of total medical admissions (Fallon et al., 2015), and that an estimated 25% of all patients in general hospitals will have a dementia (de Suin et al., 2014), there is a high probability that a large percentage of patients and hospital visitors will not have access to a car, and will therefore depend on others to drive them, use public transport, or arrive on foot if the hospital is in close enough proximity to their homes.

In addition to attending an emergency department or admission as an inpatient, many general hospitals provide geriatric day hospital facilities (Brown et al., 2015) and dedicated age-related outpatient clinics, both of which will result in a significant number of older people using the hospital on a regular basis. Therefore, it is vital that the hospital is easily accessed for older people and those living with dementia to independently and safely use public health services as an inpatient, outpatient, day hospital user, visitor, or a hospital volunteer.

The potential for hospitals to become community ‘health hubs’ places a greater emphasis on meaningful relationships with adjacent communities and necessitates a greater physical integration with local urban environment. In the UK, the Commission for Architecture and the Built Environment (CABE, now part of the UK Design Council) argues that the integration of healthcare buildings with the local community is a priority that should be achieved through ease of access and integration of public transport, and the creation of public open space that ties the facility into the community (Mason, 2006).

In this context, and considering the various age-related health services a hospital provides, the hospital often becomes one of the public facilities frequented by many older people in the community. If the hospital is in a location that forms part of an accessible neighbourhood then it will contribute to age-friendly and dementia-friendly community (Age Friendly Ireland, 2017, ASI, 2017, Alzheimer's Society, 2017) initiatives by encouraging and facilitating older people and those with dementia to go out and about in their locality. This day-to-day activity supports independence, physical exercise, cognitive stimulation, and social interaction (Mitchell et al., 2003, ROBSON, 1982).

### 3.5.2 Approaching and Entering the Hospital: Adjacent Public Spaces and Access Points

The quality of local urban environment leading up to and entering the hospital influences the ease and comfort in which any person can access the hospital. Research shows the importance of accessible, usable, safe and comfortable urban space for older people and people with dementia (Blackman et al., 2003, I'DGO, 2010, Mitchell et al., 2004) in terms of going out and about in their community.

In line with this research Burton and Mitchell (2006) present specific recommendations for designing streets and neighbourhoods for older people, particularly those with dementia, these are outlined in Box 1 below.

#### Box 1: Six Key Design Principles to Support Dementia Friendly Streets

- **Familiarity:** this concept has already been discussed earlier in this chapter and has similar application in the context of the street.
- **Legibility:** understandable sense of place and way finding achieved through the provision of good signage and multiple cues to help with way-finding and legibility. In the urban context, this means that “[l]egible streets have an easy to understand network of routes and junctions with simple, explicit signs and visible, unambiguous features” (Burton and Mitchell, 2006.p.64)
- **Distinctiveness:** this relates to the “extent to which the streets give a clear image of where they are, what their uses are and where they lead” (p.78). This concept aligns with many of the issues discussed in Chapter 3 in relation to the provision of an environment that is easy to interpret, provides distinct spaces, and provides good visual access.

- **Accessibility:** Burton and Mitchell define this as “the extent to which streets enable older people to reach, enter, use and walk around places they need to visit, regardless of any physical, sensory or mental impairment” (p.92).
- **Comfort:** defined as “the extent to which streets enable people to visit places of their choice without physical or mental discomposure and to enjoy being out of their house” (p.104).
- **Safety:** Burton and Mitchell define this as “the extent to which streets enable people to use, enjoy, and move around the outside environment without fear of tripping or falling, being run-over or being attacked.” (p.115).

The NDA’s CEUD have developed a series of booklets under the heading ‘Building for Everyone – A Universal Design Approach’ (BfE); booklets 1 and 9 (CEUD, 2014a, CEUD, 2014b) specifically provide guidance regarding the Universal Design of external environments.

In line with Burton and Mitchell, Booklet 9, ‘Planning and Policy’ (CEUD, 2014b), discusses wayfinding and signage in the context of ‘legibility’, where legibility is described as “a design concept which makes it easier for people to work out where they are and where they are going” (p.41). Physical characteristics of the landscape such as landmarks, distinctive natural features, and clear sightlines to destinations or wayfinding landmarks all serve to increase legibility. This can be supported by signage which is defined as “easily identifiable, clearly legible, distinguishable from its background and consistent in their design” (p.42).

Booklet 1 of the series, titled ‘External Environment and Approach’, deals with major design issues around topographical constraints, safety and convenience, and the balancing of various user needs in the external environment. Detailed guidance on both the pedestrian and vehicular environment is provided, which is applicable in the context of a hospital campus. Booklet 1 provides detailed guidance on pedestrian access routes, changes in level (i.e. ramps, steps etc.), surface materials, pedestrian crossing points, tactile paving surfaces and street furniture.

Providing appropriate street furniture such as well-designed seating and lighting along streets and in public spaces is important for dementia friendly design. In this regard the CEUD

'Universal Design Guidelines: Dementia Friendly Dwellings for People with Dementia, their Families and Carers (Grey et al., 2015) outline some key features as set out in Box 2 below.

**Box 2: Universal Design Dementia Friendly Guidance-Street Furniture and Lighting**

- Provide minimal street signage, especially at junctions, which concentrates on key essential information in a legible and familiar format that will be recognisable to people with dementia.
- Ensure all signage uses non-reflective material, provides large easy-to-read graphics and characters and employs contrasting colours to increase legibility of information.
- Beyond signage, other cues such as sound, touch, or smell can be used to reinforce way-finding to help with orientation and navigation. For instance, plants with distinct smells (such as lavender) may trigger certain memories and may be used at the entrance to a park or public square to help communicate the function of the space.
- Provide comfortable seating with back and arm rests every 100m to 125m. Arm rests will help a person get in and out of a seat while back rests provide additional support and resting places to lean on as a person walks along a street.
- Provide seating and shelters at bus stops to provide greater comfort and safety for people using public transport.
- Ensure that artificial lighting provides even illumination along exterior paths while highlighting key areas such as building entrances, steps, and ramps. Pedestrian walkways should have an average maintained illuminance of 30 lux, while entrances, steps and ramps should have an illuminance of 100 lux.
- Ensure that any lighting does not produce a glare, or result in excessive reflection or shadows as this may cause confusion or disorientation for some people living with dementia.
- While lighting bollards may be useful for highlighting paths it is important that they do not emit light upwards as the resulting glare may cause difficulties for people with dementia.

Similar to many campus-based public facilities (i.e. schools or universities) it is not only the location or the quality of the adjoining public space that determines the accessibility of the campus, but also the permeability of the boundary and the availability and convenience of the public access points. While there is little specific research or guidance in this area, some research shows a correlation between the number and proximity of local destinations and walking as mode of transportation (Hoehner et al., 2005, Saelens et al., 2003). There is also a positive relationship between connectivity to destinations and walkability (Zapata-Diomedes and Veerman, 2016), and this takes on added significance for older people who may take 10 to 20 minutes to walk 500m-1km in flat topography, as opposed to 5 to 10 minutes for a

younger person (Mitchell et al., 2003). Therefore, according to Mitchell et al, walking distances for older people with dementia to key facilities or public transport nodes should ideally, not be greater than 500m.

### **3.5.3 Campus Design and Onsite Circulation**

Many of the design issues outlined previously are applicable to the hospital campus and onsite circulation. Most of the Key Guiding Design Issues detailed in Section 3.5 are applicable to the campus design and will influence a wide range of broad and detailed planning, landscape and architectural features. The location of hospital facilities frequented by older people, such as day hospitals or outpatient clinics should be located for ease of access, for the reasons outlined previously. Design considerations regarding legibility or comfort are also important, while more detailed issues such as lighting or seating should also be examined. In addition to these factors, a number of campus specific design issues are also relevant including: the overall campus character; architectural quality, key external public spaces; pedestrian and vehicular movement; and parking.

#### **Overall Campus Character**

Bearing in mind the Key Guiding Design Issues such as a patient and family friendly focus or the provision of a people-friendly environment, the overall physical character of the campus plays an important role in the design of a hospital. Carpman et al. (2016) refer to the ‘symbolic meaning’ of the hospital environment and argue that the physical environment transmits a meaning and that this must send a positive message to patients and visitors as part of supporting their emotional and psychological wellbeing.

Strange and Banning (2001) acknowledge the complexity of any campus environment and identify how the physical campus influences user behaviour and communicates non-verbally. Considering the sensitivity of many people with dementia to their environment, it is important to understand how the typical campus impacts on human experience to ensure a better hospital setting for all.

While the above authors (ibid) are largely referring to educational campuses, they highlight four criteria for a positive campus environment that are useful in the design of a patient-centred hospital campus, and these include: community; territory; landscape; and wayfinding. The sense of community is helped by gathering spaces, sitting areas and green spaces.

Territory is about calling a place your own and is provided by distinct spaces, while landscape refers to the provision of natural landscape areas helped by a mixture of legibility (safety) and mystery (opportunity). At a more detailed level the presence of water features (Ulrich 1983) is often cited as a positive attribute on a campus setting. In general, views to natural landscapes have shown to be beneficial to human health and wellbeing in various settings including hospitals (i.e. Ulrich 1984). Some of these aspects have been discussed in Section 3.5 and will be discussed in more detail in subsequent sections relating to specific spatial scales.

### **Architectural Quality**

The design quality of buildings and hard infrastructure on the campus is determined by: building mass; height; scale; fenestration; materials; details and finishes; colour and other related design characteristics. This architectural design quality influences the overall feeling and appearance of the campus and must be carefully considered in the context of a dementia friendly hospital. While the architectural form of a hospital will be determined by a range of factors including the brief, site conditions or the local context, the concept of a patient and family friendly, human-scale environment, as outlined in the Key Guiding Design Issues, is an important design consideration.

Burton and Mitchell argue that distinctiveness is key to making buildings more comprehensible for people with dementia. They outline some key architectural features to achieve this including:

- Reflecting local character to make buildings more familiar.
- Use of varied building forms to make key locations and parts of the building more identifiable.
- Creation of interesting and understandable outdoor spaces.
- Use of landmarks such as distinctive structures, or the use of specific aesthetic features (i.e. planting or water feature) or practical features (i.e. street furniture or building element) as environmental cues.
- Design that reflects a building's use.
- Obvious entrances.

Beyond using design for spatial orientation and wayfinding as outlined above, Fleming and Bennett argue that a dementia friendly building should provide a human scale (Fleming and Bennett, 2014) so that people with dementia do not feel overwhelmed or intimidated by the building. While this design approach is largely applied to residential care home environments, it is also applicable to the hospital setting. The authors point to research in the acute setting (Fottler et al., Remen) illustrating how a more homelike and compact scale in the hospital can make the environment less confusing, more comfortable, and facilitate better patient monitoring.

### **Key external public spaces**

A hospital campus may contain a range of external public spaces, from campus entrance areas or roads and walkways, to building entrance plazas or public campus gardens. These spaces function as important circulation areas, wayfinding features, or social spaces and should take account of the various dementia friendly design issues outlined previously. According to Mason (2006), in a patient-centred healthcare setting, external spaces should be well managed, give priority to pedestrians, and provide sensitive planting to enhance the natural environment.

The external campus environment, along with any adjacent lands or neighbourhood adjoining the campus, provides the ‘outside world’ as viewed from within the hospital. Therefore, the quality of this external environment will greatly influence the quality of the internal environment in terms of views, natural light, access to nature, acoustics, air quality, and a range of other environmental factors. The need for dementia friendly design to support positive sensory stimulation has been outlined in Section 3.5, and is again discussed later in Section 3.6.5 - Key internal and external spaces, and Section 3.6.7 - Internal environment. However, as a consequence of the importance of natural light and views to nature in the hospital setting, Ulrich et al (2008) argue that careful site planning and building orientation should be used to maximise these positive effects and avoid a scenario where adjacent buildings block views or light.

The provision of external spaces directly accessible and usable by patients, family and staff is an important therapeutic component of a hospital and this is discussed in detail in Section 3.6.5 as part of the examination of key internal and external spaces.



## **Pedestrian and vehicular movement**

Many of the Key Guiding Dementia Friendly Design Issues discussed in Section 3.5 are applicable to this section. Providing a patient and people friendly environment, balancing sensory stimuli, or wayfinding features from Huelat's Master Plan block and Architecture and Landscape block, others, are all relevant. The dementia friendly street principles (Burton and Mitchell, 2006) or the street furniture and lighting section from Universal Design Dementia Friendly Guidelines (Grey et al., 2015) also provide useful guidance. For instance, the provision of seating every 100m to 125m is pertinent on large hospital campus, particularly in situations where public transport does not enter the site.

Hospital settings, particularly those with 24-hour activities have been identified as risky environments in terms of crime (Felson and Boba, 2010, Cozens, 2011), with for example, hospital grounds or parking facilities providing opportunities for assault (York and Colling, 2001). Therefore, perceived or real fears of crime within a hospital campus may also evoke fear or anxiety. Scarborough et al (Scarborough et al., 2010) outline how fear of crime can contribute to higher levels of anxiety, depression and distrust, pointing to research that identifies older people and women as those most fearful of crime. In this regard many older people have reported fears about being attacked when out and about and consequently avoid certain places, or do not go out at all after dark (Burton and Mitchell, 2006).

In response to real and perceived fear of crime, a planning, urban design and architectural design approach known as 'Crime Prevention Through Environmental Design' (CPTED) has been developed. This aims to promote environmental design and management practices that create safer places for inhabitants and discourage criminal activity by increasing passive security and by making targets such as property less attractive for criminals. CPTED is also concerned with reducing fear of crime by designing out spaces that make people feel insecure or vulnerable (Balducci et al., 2007, CEN, 2007).

While concerns around security, fear and perception of crime are applicable to the wider population, people living with dementia who may already feel insecure, anxious, have a sense of menace (Kitwood, 1997), or fear getting lost when outside, may benefit from CPTED approaches. These design approaches not only reduce realistic opportunities for criminal activity, but more importantly in the context of a hospital, help create public and semi-public spaces that support caring and healing through and environment that feels safe and secure.

The fear of being run-over is another concern that has been expressed by older people (Burton and Mitchell, 2006) and this may be relevant in the hospital setting where emergency services and members of the public will be accessing the hospital at greater than normal speeds. Some of the site design recommendations set out in the Health Building Note 00-01 'General design circulation for patients, staff, and visitors (including those with disabilities) in the form of pedestrian, cycle, vehicle and public transport; dedicated blue-light routes; and segregated goods and services routes.

### **3.5.4 Building Entry and Internal Circulation**

Mason (Mason, 2006) refers to the German phrase 'schwelle angst', meaning fear of the threshold, and highlights how this is particularly relevant to patients entering the healthcare environment. He argues that a well-designed entrance can lower this psychological barrier by being well-placed, provide easy access for all users and be pleasant, calm, and welcoming. Referring back to Section 3.5, design issues around providing a human-scale and familiarity, and good orientation, wayfinding, visual access, will all contribute to the creation of a good entrance.

The overall way-finding framework outlined earlier by Huelat (Huelat, 2007), reinforced by legible spatial organisation and the use of environmental communication as described by Passini et al (Passini et al., 1998) will help to support people with dementia to navigate within a hospital.

The adoption of the 'hospital street' in many hospital developments (O'Dwyer, 1997, Prasad, 2012) is an example of a spatial organisation that supports orientation, legibility and wayfinding, particularly in the context of large and complex hospitals.

Huelat advocate employing maps at critical decision points and the use of simple user-friendly language and terminology will also aid navigation (Huelat, 2007). In addition, she refers to the wayfinding role played by facility amenities such as information desks, this is reiterated in other literature where recommendations include one main reception and information point (Mason, 2006) located in an obvious location (Fleming and Bennett, 2014).

### 3.5.5 Key Internal and External Spaces

The design of internal and external spaces should incorporate all of the key design issues discussed in Section 3.5. According to these issues, adopting a human scale that softens the institutional character and introduces some level of familiarity will contribute to a dementia friendly approach.

A number of hospital specific guidance documents reiterate the benefits of familiarity and promote the use of domestic scale seating and dining areas; personal and self-care items; photographs and memory boxes; recognisable sanitary ware; and, traditional crockery and cutlery (Waller et al., 2013). Furthermore, Fleming and Bennett (Fleming and Bennett, 2014) contend that the environment should afford a patient an opportunity to preserve their competence through the use of familiar furniture, fittings and colours in the hospital setting. In terms of personalisation, Fleming (DEEP and Fleming, 2016) proposes that people with dementia should be able to personalise their environment with familiar objects, while the Health Building Note 08-02 (Department of Health (UK), 2015) promotes personalised artwork in spaces to support self-esteem and personal identity:

Doors should be personalised to improve navigation and way-finding, thus enhancing independence. Coverings, artwork and personal objects can be positioned on doors to bays, single rooms.... Due consideration needs to be given to patients' and residents' cultural background to avoid upsetting personal feelings and beliefs (p.54).

Design that maximises positive sensory stimulation such as light, views, or contact with nature as outlined in Section 3.5 has been identified by researchers as a beneficial component of hospital design. While minimising negative sensory stimulation such as noise or glare appear to be equally important.

The large-scale spatial configuration of a hospital building has been discussed previously with regard to orientation, legibility and wayfinding. In terms of specific spaces within the hospital, a number of areas appear in the literature including the ED waiting rooms, and inpatient wards, and these are now discussed below.

**Emergency Department:** Research identifies the emergency department (ED) as a particularly challenging environment for a person with dementia, and that there are often

poor clinical outcomes as a result (Parke and Hunter, 2017). Clevenger et al. (2012p1743) point to the incompatibility of dementia and the emergency department:

“Dementia and the ED do not mix successfully; the ED experience is “vulnerable to a rapid escalation of risks”. Dementia lowers the threshold for sensory over-load, distress, and disruptive behaviors. The ED is fast paced and overwhelming even to cognitively intact individuals. Dementia may contribute to inaccuracies in the medical or medication history, difficulties gathering a history of the present illness, or an individual’s inability to comprehend or follow complex discharge instructions. Any of these may cause untoward clinical outcomes”.

In this context Clevenger (ibid) has reviewed the literature around clinical care in the ED for people with dementia, and while the review demonstrated a dearth of intervention based research specific to people with dementia in the ED, there were some interesting findings regarding assessment, communication, adverse events, and education. There was also a range of recommendations regarding the physical environment, including: the need for some form of seclusion for people with dementia or designated spaces; adequate lighting and space for caregivers; reduction of environmental overload; and, proximity to nurses’ stations. Non-dementia specific recommendations for older people included: improved lighting and acoustics; non-slip surfaces; pressure reducing mattresses and cushions; visual aids and hearing devices; adaptive equipment; and, appropriate ambient temperatures.

The DSDC guidance ‘Design features to assist patients with dementia in general hospitals and emergency departments’ (DSDC, 2012) also identifies the ED as a challenging environment for people with dementia. This guidance highlights some key problems such as the unfamiliarity of the environment and difficulty in making it familiar; difficulties in achieving sufficient levels of observation for patient safety and to alleviate anxiety for a person with dementia; and the fact that EDs are very busy environments with multiple routines and activities. To mitigate against these challenges, the guidance identifies numerous key dementia friendly design features that can be employed regarding spatial orientation, wayfinding, better acoustics and lighting, and others.

**Waiting rooms:** The DSDC (2012) recommends the use of consistent flooring and a furniture that contrasts with the floor. Sound absorption, plentiful light, good signage, and a pleasant view are also helpful.

**Overall inpatient wards:** Ulrich et al (2008) highlight findings showing how certain ward configurations can impact on the care delivered by staff by reducing the amount of walking required, and increasing time spent with patients. For instance, some research shows how decentralised nurses stations can also reduce walking distances and increase patient time.

**Inpatient bedrooms:** For long term residential care Marshall recommends single rooms with enough space for personal belongings (Marshall, 1998b); this helps with familiarity and personalisation as discussed previously. In the hospital context a single room has some advantages for a patient with dementia such as more privacy, less noise, and better quality of sleep (Ulrich, 2006, Ulrich et al., 2008) (van de Glind et al., 2007). A single room may also be more supportive for the accompanying person where a reclining chair, fold-away bed or couch can be provided (DSDC, 2012).

Research regarding acuity-adaptable rooms is also worth considering in the context of patient rooms for people with dementia. Ulrich et al (2008) discuss the benefits of acuity-adaptable rooms that can cater to a wide range of patient needs without having to transfer them to another room, or another part of the hospital.

Patient transfer is a particular problem for older people and people with dementia. Coleman (2003) argues that patients with complex care needs will often require care in multiple settings, and that during transition from one setting to another, these patients are particularly vulnerable. In this regard, and referring specifically to older people, Naylor et al state that:

“[f]requent transitions within a hospital, such as from the ED to an ICU to a step-down unit to a general medical–surgical unit, can have devastating effects on the health of older adults and the well-being of family caregivers. For example, serious medication errors are common during transition periods” (Naylor and Keating, 2008).

Ulrich et al (2008) highlight that acuity-adaptable rooms eliminate many of the problems associated with these transitions. It could also be argued that maintaining a person in one room will support orientation, increase familiarity with the space and staff, and in turn improve navigation for a person in that part of the hospital.

While many of the features achievable in a single room are difficult to implement in multiple-bed room there are advantages to a shared environment including greater levels of

supervision, social interaction with other patients, and more opportunities for a person with dementia to see staff or carers, and thus reduce anxiety. The following give examples (DSDC, 2012, Royal College of Psychiatrists et al., 2013) of what is recommended for multi-bed rooms in terms of dementia friendly design:

- Differentiate each bay using colour or images above the bed to make them more recognisable.
- Provide space for people to bring in some personal belongings for familiarity and personalisation.
- Ensure there is enough space to provide a small table and chairs beside the bed to allow a person to get out of bed and sit or eat a meal. This will also support an accompanying person who may have to assist with eating or other bedside tasks.
- Provide sufficient space for an accompanying person to sit one side of the bed (as outlined above), and for a staff member to sit on the other side.
- Provide low-low beds (beds that lower to floor level) (Nitz et al., 2012).

For all rooms the various dementia friendly design issues described previously should be considered such as: providing a more patient-friendly and human-scale environment, facilitating familiarity and personalisation, balancing sensory stimulation, and supporting orientation, wayfinding, and visual access.

**Toilets:** Toilets should be as domestic looking as possible and use recognisable features, and colour contrast effectively.

**Day rooms:** The use of day rooms for activities, dining, or engaging with visitors or other patients (Andrews, 2013, DSDC, 2012), has already been discussed. The DSDC (2012) advise that clear signage on the outside of the entrance door, and the use of appropriate furniture and fittings that offer strong visual cues as to the purpose of the room is important. They suggest a variation of lounge seats and different configurations of tables and chairs, all using colour or tonal contrast. A counter with a sink will provide space for activities such as making tea, while a retreat space such as a small side space or alcove, with a bench or chairs, will offer a person the chance to sit and watch, or be with family members.

**External Spaces:** The benefits of external spaces have already been discussed earlier in this report and these include: change of scene; exposure to nature; exposure to natural light; outdoor space as a ‘restorative’ environment; outdoor activities as general therapy; outdoor activities as physical exercise; and, space to socialise. Various hospital guidelines (Waller et al., 2013, Fleming and Bennett, 2014, Department of Health (UK), 2015, DSDC, 2012) recommend the provision of a secure, accessible and usable, and calm outdoor space for patients, accompanying persons and visitors. In addition to alleviating certain challenging behaviours such as pacing or wandering, an outdoor space such as a garden can also function as a space for rehabilitation.

While, ease of access and usability, proximity, and views to outdoor spaces are important features of outdoor spaces, it is also vital to consider boundary conditions between interior and exterior space. These edge spaces mediate the relationship between inside and outside, and temper the environmental conditions of natural light, wind, rain, and sound, and therefore impact on a person’s experience as they transition between the two spaces. Edge spaces often afford rich natural and social ecology and can provide spaces of interest and interaction {Chalfont, 2005 #861}. These qualities of transition or edge spaces can be exploited to draw people outside, make this transition comfortable.

*When it is properly made, such an edge is a realm between realms: it increases the connection between inside and outside, encourages the formation of groups which cross the boundary, encourages movement which starts on one side and ends on the other, and allows activity to be either on, or in the boundary itself (Alexander et al., 1977) (p755)*

Based research and recommendations that appear in the literature regarding edge spaces or transition spaces for people with dementia {Chalfont, 2005;Cooper Marcus, 2007; Delhanty, 2013; Grant, 2007; Zeisel, 2007}, the following should be considered:

- Provide conservatory overlooking garden to enjoy semi-outdoor experience
- Provide shaded entry patio with seating that gets late evening sun
- Provide degrees of shelter providing various levels or climatic protection
- Covered external in-between spaces such as a porch can allow a person ‘preview’ an activity before committing to involvement or participation
- These covered transition spaces also allow a person’s eye to adjust to outside lighting levels or support who may be anxious about the weather



### 3.5.6 Building Components

All of the previous sections either describe key design issues or the overall design of key spaces across the spatial scale. These issues and spaces are achieved through the careful design of individual features that are detailed individually in a number of guidelines. For example, both the DSDC guidance (DSDC, 2012) and the Heath Building Note 08-02 (Department of Health (UK), 2015) break the physical environment down into a number of core design features and provide specific guidance around each feature in order to support dementia friendly design. This includes guidance regarding floors; walls; skirting; handrails; ceilings; doors; signage; colour; artwork, etc, and details can be found in those documents.

Technology is becoming an increasingly important component in dementia friendly design, and the in the hospital environment. As discussed previously, one the main applications of technology for people with dementia relates to safety, and in this regard, there is a range of technological developments including: assistive technology; ambient assisted living, and telecare or telehealth (Grey et al., 2015). The use of monitoring equipment (Andrews, 2013, Nugent and Augusto, 2006), and technology for the prevention and monitoring of falls (Cameron et al., 2012) has also discussed. These safety concerns notwithstanding, technology can also be used to provide multi-sensory stimulation. The ‘Snoezelen’, room (Baker et al., 1997) is an example of this where multi-sensory stimulation is achieved through visual effects using water columns, fibre-optic cables mirror balls, screen projectors, video, an interactive projecting systems; sound effects through musical selections; tactile stimulation using vibrating water beds, and olfactory stimulation using aroma therapy equipment (Maseda et al., 2014). A number of studies have shown multi-sensory stimulation to be an appropriate and effective therapy for people with dementia (Baker et al., 2001, Maseda et al., 2014).

Beyond technology specifically used for patient safety or sensory stimulation, healthcare technology is always evolving, and new innovations such as robotic telepresence (Becevic et al., 2015) where remote controlled mobile robotic devices allow doctors to interact with other staff or patients from a distance. While this may be beneficial and effective in terms of delivering medical care, it is worth considering how such technology will be perceived by a person with dementia based on the various cognitive impairments previously discussed in this report.

### 3.5.7 Internal Environment

In terms of the indoor environment, Bluysen (2009) outlines four basic environmental factors that affect how people perceive their environment, and in turn how this environment impacts on their health and well-being. These include:

- Thermal comfort or indoor climate (temperature, moisture, air velocity etc.);
- Visual or lighting quality (view, illuminance, reflection, etc.);
- Indoor air quality (odour, fresh air, air pollution, etc.); and,
- Acoustical quality (indoor and outdoor noise, vibrations, etc.).

While these environmental factors refer largely to the traditional senses of sight, hearing, smell, taste, and touch and temperature, Bluysen (2009) also points to the relevance of human kinaesthetic sense and the sense of balance or equilibrium. While the human senses are often considered in isolation, it is important to acknowledge the interplay of these senses (Clements-Croome, 2013), and therefore useful to consider Gibson’s concept of ‘perceptual systems’ (1968). Gibson identified the following five systems: the orienting system; the auditory system; the haptic system; the taste-smell system, and the visual system, and he illustrated how these systems interact and co-operate in different combinations.

While the auditory system or visual system may be obvious enough, Gibson’s description of the haptic system is interesting in the context of design for enhanced sensory environments for people with dementia. He describes the haptic system as:

“an apparatus by which the individual gets information about both the environment and his body. He feels an object relative to the body and the body relative to the object. It is the perceptual system by which animals and men are literally in touch with the environment.” (ibid.p.303)

In this regard Pallasmaa (2013) presents touch as “the sensory mode that integrates our experiences of the world and of ourselves” (p86) and advocates for a more complete approach to design with greater emphasis on hapticity and tactility in the built environment.

With this complex multi-sensory person-environment relationship in mind, Hawkes (2008) laments the constrained environmental conditions that exist in many modern buildings and argues that: “[t]he complex sensory experience that we enjoy in buildings implies a wholly

different dimension to the idea of the architectural environment from the pragmatic and mechanical processes of climate modification and comfort engineering.” Advocating similar sensibilities, Pallasmaa speaks about the “Architecture of the Senses” (2005 p.48) and points out how human senses are stimulated within an architectural setting . He argues that we confront the world through all our senses, and that architecture plays an important mediating role between humans and the world through these embodied experiences.

While the above relate predominantly to the passive aspects of the internal environment, there are also more active elements such as artwork that also determine the quality of the internal environment. In the context of the hospital setting, Drahota et al (2012) identify these interventions as ‘positive distracters’ that provide sensory stimulation; while not as part of any specific therapy, these distractors can include art, aromas, colour, and music or the playing of natural sounds such as birdsong.

If multi-sensory stimulation within a building is an important part of the human experience, then it may have added significance for people living with dementia who may experience altered perception and acute sensitivity to environmental stimulus as part of the condition. Therefore, when designing for people with dementia who are often more sensitive to their environment, and yet at the same time have a greater reliance on all their senses in terms of navigation or orientation, the design of the internal environment is critical to dementia friendly design. Taking cognisance of the human senses, typical environmental factors, and the positive distractors, as discussed previously, internal environmental conditions relevant to dementia friendly design include:

- Visual properties: appearance of surface and material finishes; colour and contrast; natural and artificial lighting, visual artwork.
- Acoustic properties.
- Tactile and haptic properties.
- Kinaesthetic opportunities.
- Thermal comfort: air temperature, air velocity, and relative humidity.
- Indoor air quality.

In the context of the impairments and needs of people with dementia, and the environmental conditions outlined above, Fuggle contends that designers should “act as

environmental editors” decluttering and streamlining interiors where required to enhance wellbeing and promote good health (Fuggle and DSDC., 2013).

### **3.6. Conclusion**

The preceding literature review has examined planning and design issues across the full spatial spectrum in the hospital and has produced a range of findings to inform the following exemplar chapter, and also underpin the overall findings emerging from this research.

## 4. Irish Dementia Friendly Hospital Design Exemplars

### Genio and HSE- Integrated care pathways in the acute hospital sector for people with dementia



Figure 4.1 Family Room, MUH, Cork

#### 4.1. Introduction

The Irish Health Service Executive (HSE) and Genio<sup>5</sup> Dementia Programme 2012 to 2018, which is being supported from the philanthropic organisation Atlantic Philanthropies<sup>6</sup>, is an initiative to develop and test new services and community-based supports for people with dementia<sup>7</sup>. One of the main elements of this programme involves 'Integrated care pathways in the acute hospital sector for people with dementia'. This focuses on the acute hospital setting to develop care pathways to improve the overall experience for a person with dementia from admission to discharge.

<sup>5</sup> Genio is an Irish-based non-profit organisation working with government and philanthropy to transform social services - see <https://www.genio.ie/>

<sup>6</sup> See <http://www.atlanticphilanthropies.org/>

<sup>7</sup> See <https://www.genio.ie/our-impact/research-evidence/hse-genio-dementia-programme-overview>

Three hospitals were selected, St. James's and Connolly Hospital in Dublin, and Mercy University Hospital in Cork, to develop an integrated approach across each hospital including: the mapping and analysis of patient pathways; diversion away from Emergency Departments to more appropriate community based supports; improvement in admission and discharge processes; staff awareness raising and training; and environmental changes to make the hospital more dementia friendly. This chapter briefly looks at each hospital to examine the environmental changes implemented and to illustrate the key physical features and design approach in each location. For St. James's Hospital, it should be noted that some spaces and design features illustrated were not specifically designed as part of the HSE/Genio programme, but are included where they demonstrate design that supports people with dementia.

## **4.2. Methodology**

The Dementia Friendly Design Issues, as discussed in Chapter 3, are used as a framework to investigate aspects of the hospital design that are particularly relevant for people with dementia. For each hospital, where design features relate to the various design issues, they are discussed under that respective issue, where there are no related features, these design issue is ignored. Where aspects of the design do not fit with any specific issue, these are discussed as 'Other Issues'.

## 4.3. Discussion of Irish Hospital Exemplars

### 4.3.1 St. James's Hospital

James's Street, Dublin 8, Ireland.



**Figure 4.2** – View to front of hospital

St. James's Hospital (SJH) is Ireland's largest academic teaching hospital, which started its development as a modern campus in the mid-1980s and has been developing since. SJH is a Level 4 hospital delivering secondary to tertiary services at local, regional, and national levels. The hospital has approximately 1000 beds and 3500 staff.

Three aspects of the hospital have been examined as part of this project, these include: the refurbishment of selected ED bays (see Figure 4.5); the redesign of the Mercer's Ward day room (see Figure 4.6); and the implementation of new wayfinding signage and graphics throughout the Mercer's Institute of Successful Ageing (MISA) building (see Figure 4.3); which has recently been completed on the campus. The MISA facility contains St. James's Hospital department of Medicine for the Elderly and provides research, teaching, and patient-facing services, such as an outpatients clinic. The building has 4 inpatient wards across 4 floors. In addition to wayfinding in the MISA building, other aspects of this building will be discussed that demonstrate dementia friendly design issues.

The following section identifies specific design features within these areas that support the various key dementia friendly design issues as highlighted in this current research report.



### 4.3.1.1 Support engagement and participation

**Promote engagement with friends and family, staff and community:** The location of the MISA building within the inner city and in close proximity to public transport enables easy access for patients and visitors. In addition, the siting of the building along the periphery of the campus, and the creation of a new hospital access point and main entrance on the campus boundary, provides an easily located and more public-facing facility within easy reach of the community.



**Figure 4.3** – View to front of the MISA building showing the adjacent Luas line

**Provide space and supports so that accompanying persons can remain with the person with dementia, where possible, throughout their time in the hospital:**

Internally the MISA building contains a number of inpatient wards, predominantly composed of single rooms. The provision of benches along the external window in these rooms provides alternative seating for patients or staff, but also creates a visitor zone where visitors can sit or where an accompanying person can remove themselves to, if appropriate, when the patient is being seen by staff. This provides the space for an accompanying person to remain with the patient without obstructing staff or feeling like they are in the way.



**Figure 4.4** – Single room with bench area along external wall

In the ED within the main hospital, two ED bays have been redesigned to make them more dementia friendly. While these bays contain a number of relevant dementia friendly features that provide a better environment for accompanying persons who themselves, may or may not have a dementia (i.e. décor, lighting, privacy screens etc. that will be discussed later), the provision of fixed seating is one element that is directly beneficial. An accompanying person may spend many hours by the side of a patient in an ED bay, and in a busy ED appropriate seating may not always be available. Fixed seating within a bay ensures that accompanying persons have a place to rest, which will be of added importance if that person has a disability, illness or is an older person.

The fixed seating in the ED bays was also incorporated with patients and staff in mind. Some patients prefer to be seated rather than lying down on a trolley and this provides that option. Staff regularly conduct their consultations side-by-side with patients on the fixed seats. This changes the dynamic between patient and medical staff- i.e. staff don't always have to stand over patients to consult with them. It also provides a place for staff to write up their notes.



**Figure 4.5** – ED bay with fixed seating, calm colours, good colour contrast for visual orientation, privacy screen (to extreme left), day and time display screens, mood lighting, and decluttering.

**Promote a participatory design approach:** all key stakeholders contributing in a meaningful way to ensure their needs and preferences are incorporated into the design process: Works to the ED bays, MISA wayfinding and the Mercer’s Day Ward day room were all undertaken in collaboration with staff to one extent or another. Changes to the ED bays and day room were conducted in conjunction with various staff. 5 patients with a dementia were tracked throughout their journey through ED and observations were recorded of their experiences. This was used to inform the changes to the bed bays

In terms of wayfinding, a steering committee was used to develop and agree the wayfinding strategy for the MISA building. In addition, 2 people with dementia were involved in the initial wayfinding project (as well as 2 people with physical disabilities, a person with a visual impairment and an older person with no disabilities). The findings from this project informed the changes made in the MISA building.



### 4.3.1.2 Provide a people-friendly environment

**Soften the institutional environment:** more human-scale, less clinical or austere in appearance: The new colour of the ED bay and the removal of redundant clinical equipment provides a less clinical appearance to the bay. Within the Mercer’s family room, the use of soft pastel colours and wainscoting panelling provides a less austere setting, while the creation of a storage area separated by timber shelves, screens ward based equipment that would otherwise create a more clinical and utilitarian atmosphere within the room. These shelves can be used for books, pictures and other features that create a more homely setting. The provision of a two-seater bench integrated into the window provides a more intimate sitting area that also relieves the austere nature of the space.



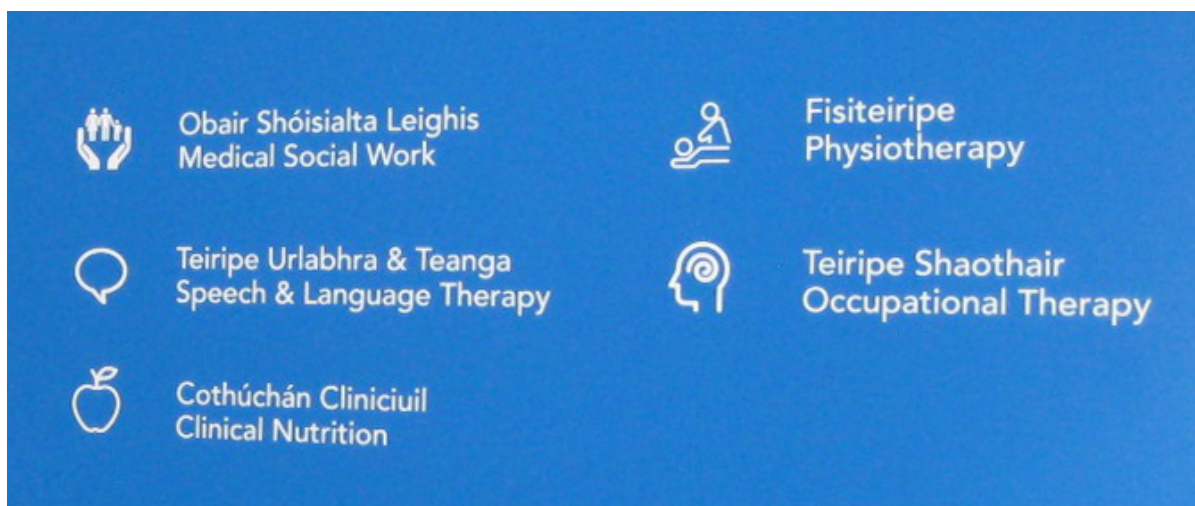
**Figure 4.6** – Day room in Mercer’s ward with bench seat and shelving (left) and wainscoting (right)

Throughout the MISA building, the architecture seeks to create a less austere and more human scale environment through massing and building form, natural light, colour, artwork, and finishes.



**Figure 4.7** – Corridor MISA Building

**Familiar design:** recognisable design that is easily understood and intuitive to use: While many of the design features outlined above in Mercer’s family room provide a more familiar setting, the design of wayfinding throughout the MISA building provides an example of how familiarity can be used to reinforce design. The icons created for each department are based on familiar images that people might associate with various specialities such as a speech bubble for ‘Speech and Language Therapy’ or an apple for Clinical Nutrition.



**Figure 4.8** – Wayfinding signage and graphics

**Facilitate personalisation:** provide opportunities to add personal belongings such as photos to reinforce identity and help with orientation: Figure 4.8 above shows how the locker and bench within the single bedroom in the MISA enables patients to personalise their room using photographs or other belongings. In addition, a whiteboard mounted on

the wall adjacent to the end of the bed provides a space for non-medical personal details, such as the names of family members, like and dislikes, or hobbies. This not only facilitates personalisation but also provides the staff with valuable person-centred information about the patient.

### 4.3.1.3 Support patient safety, wellbeing & health

**Provide a safe environment:** unobtrusive safety measures that do not conflict with other issues such as privacy or the freedom to engage in physical activities: While the fixed seating within the ED bay guarantees that seating will always be available within the bay, it also ensures that it cannot be picked up or propelled by a patient or accompanying person if they become agitated or violent.

Another non-obtrusive safety feature includes the glazed observation panel in the patient bedroom doors (Figure 4.9). This glazing is fitted with integral blinds that are operable from the corridor, therefore allowing staff to temporarily open the blinds to check on the patient without having to open the door, but maintain privacy for the patient at all other times. The integral blinds are also important from an infection control perspective.



**Figure 4.9** – Openable blinds in observation panel. Open blinds allowing view to room (left) and closed blinds maintaining privacy to the room (right).



**Support diet, nutrition and hydration:** calm, accessible and usable spaces, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite: The size, layout and privacy provided by the single rooms creates calm conditions for the patient, and provides accessibility for an accompanying person to assist or provide company during a patient's meal. Communal dining spaces and day rooms situated in each ward help with nutrition, while the introduction of blue crockery as a visual aid, and prompting at mealtimes also support nutrition within the hospital.

**Support meaningful activities:** including physical, social, and activities of daily living (ADLs): The Mercer's day room provides a space within the ward for patients and visitors to sit and talk, read, watch TV, or play games. The layout of the space provides different seating configurations so that a number of individuals or small groups can use the room in a way that supports more intimate or private interaction.

#### 4.3.1.4 Balance sensory stimulation

**Optimise positive sensory stimulation** (i.e. sunlight, music, artwork, images of nature etc.) while minimising negative stimulation (i.e. noise, glare etc.) as part of a calming and therapeutic approach: The MISA building is designed to maximise light and provide a gentle environment through the careful use of colours and finishes. The Mercer's day room adopts a similar approach, including the provision additional controls for artificial light, and views to an outdoor space that is soon to be landscaped and screened off from the adjacent exterior service area.

However, the redesign of the ED bay illustrates some key features pertaining to sensory stimulation. In recognition that the ED is a particularly challenging environment for people with dementia, features including: a calming green or blue wall colour; adjustable ambient lighting set by the patient, accompanying person or staff according to preferences or mood; a solid, folding screen to provide greater visual privacy and acoustic insulation to the bay; and the removal of redundant or underused equipment to present a less cluttered and more sedate environment.





**Figure 4.10** – ED bay showing different ambient light settings

**Provide contact with nature and access to outdoor space to support active and passive therapeutic activities:** As mentioned above, the outdoor space has been designed for the Mercer’s day room that will be landscaped with a variety of plants and provided with bird tables and bird boxes. While occupants will not be able to access this space directly, openable windows will admit fresh air, birdsong and other outdoor sounds.

#### **4.3.1.5 Support orientation and navigation**

**Support orientation to date, time, location, etc. and improve spatial cognition:** Within the ED bays the day and time display screens will help with temporal orientation while the colour contrast between the walls and floors will help with spatial orientation. Similarly, in the Mercer’s day room, the use of colour and tonal contrast and views to the garden space will support spatial and temporal orientation.

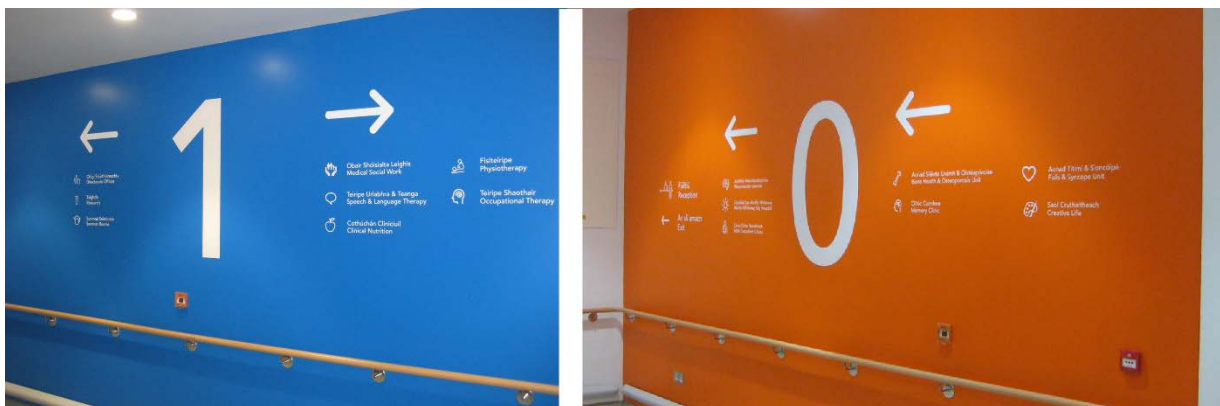
Throughout the MISA building the use of natural light, and internal and external views provides visual cues about location and time of day or weather conditions as one circulates

within the building. The use of colour and tonal contrast between floors, walls and doors/doorframes enhances spatial orientation.



**Figure 4.11** – Wayfinding signage and graphics

**Provide good way-finding that supports navigation;** this is linked to orientation but is largely about finding your way around or getting from one place to another: The wayfinding strategy employed in the MISA building demonstrates many best practice features regarding orientation and navigation in a complex building. Colour coding is used to identify each floor while signage and directional information is provided at key decision points within vertical circulation area, such as the passenger lift and stair core, and at key junctions in corridors and other horizontal circulation areas (see Figure 4.12 below).



**Figure 4.12** – Wayfinding colour coding, signage and graphics in lift and stair core

The wayfinding information follows a hierarchy that presents information in a progressive manner, for instance the floor numbers are presented in a very large format as a person firstly needs to know are they on the right floor, and then more detailed information, such as specific departments within that floor, are presented in a smaller format, as secondary information. Easily understood language and terminology is where possible (i.e. Bone Health, Memory Clinic, Falls etc.) and these are accompanied by clearly associated symbols or icons.



**Figure 4.13** – Wayfinding signage, directional information and graphics

**Provide good visibility and visual access:** Optimise lighting conditions and make sure important features (e.g. handrails), spaces (e.g. toilets), and people (e.g. staff) are clearly visible: Both the ED bay and Mercer’s day room have improved both the level and control of artificial lighting. In the MISA building there is a high level of natural light penetration, while the use of clear glazing to internal courtyards and associated circulation areas, along with colour and tonal contrast ensures good visibility and visual access within the building. With regard to the single bed room as discussed earlier, the observation panel on the door provides visual access for the staff (see Figure 4.13 above), while internally the location of the bed provides direct visual access to the toilet door and a good view out the window.

#### 4.3.1.6 Adequate space to support the needs of a person with dementia

**Bays or single rooms with space for personal belongings and adequate room for visitors:** As outlined in 4.3.1.1 above, the MISA single bed rooms provide space to personalise the room and areas for visitors to comfortably beside the bed, or on the bench by the window.

**Space for retreat in multi-bed wards** (i.e. quiet sitting room for patients and family that can be used as respite from busy ward) **and communal areas in single-bed wards to allow social interaction:** The Mercer’s day room will provide a calm space for a patient to retreat from the busy 31-bed unit. The seating layout and views to the outdoor area will enable a patient to sit alone or with a group, depending on their preferences.

**Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes:** Again, the Mercer’s day room deals

with some aspects of this issue, by firstly providing a location for a patient to travel to, and secondly by providing a space for to engage in activities.

#### 4.3.1.7 Appropriate use of technology

**Appropriate use of technology for care delivery, safety or therapy** (i.e. sensory stimulation): The lighting within the ED bay (see Figure 4.10 above) illustrates how technology can be used to support patients. In the busy ED environment where negative sensory overload can be a problem, the adjustable ambient lighting represents a therapeutic technology that can alleviate an austere and overtly clinical setting by changing the lighting colour temperature to create either a calming, restful, or stimulating lighting environment, as required.

#### 4.3.1.8 Discussion

The works carried out in St. James's represent how a variety of dementia friendly design approaches and features can be applied in both existing and new buildings. While not all features are present in each location discussed, St. James demonstrates how this approach improves the overall environment, and it is not hard to imagine how all these features could be brought together to form a holistic approach to dementia friendly hospital design.



## 4.3.2 Mercy University Hospital Cork

Cork City, County Cork, Ireland



**Figure 4.14** – Mercy University Hospital Cork

Mercy University Hospital, Cork, was founded in 1857 and has evolved into a modern acute general hospital that provides inpatient, day-patient, outpatient services and emergency department services in the centre of Cork City. The hospital has 332 beds and employs approximately 1,000 staff.

Two areas within the hospital are presented in this report, including St. Mary's Geriatric Ward and the provision of a dementia friendly bay in the emergency department. The following section identifies specific design features within these areas that support the various key dementia friendly design issues as highlighted in this current research report.

### 4.3.2.1 Support engagement and participation

**Promote engagement with friends and family, staff and community:** The provision of a new dayroom creates a dedicated space for patients, family and visitors to interact in a relaxed, home-like environment (See Figure 4.15 below). The placement of Cork-based photographs within the circulation areas of the ward also provide a link to the community, these images may also prompt conversations between patients and others and therefore support engagement



**Figure 4.15** – Dayroom in Cork Mercy Hospital

**Provide space and supports so that accompanying persons can remain with the person with dementia, where possible, throughout their time in the hospital:** The dayroom provides a space for an accompanying person to spend time with the patient away from the ward environment. It also provides a rest or retreat space for a family member if they are spending much time in the ward accompanying the patient.

**Promote a participatory design approach: all key stakeholders contributing in a meaningful way to ensure their needs and preferences are incorporated into the design process:** All environmental changes were undertaken in close collaboration with key clinical and facility management staff.

#### **4.3.2.2 Provide a people-centred environment**

**Soften the institutional environment: more human-scale, less clinical or austere in appearance:** As illustrated above, the dayroom is decorated and fitted out in very home-like, relaxing and non-institutional manner. This is reinforced by the comfortable couch and armchair, while a dining table and chairs provides another relaxed setting within the room to chat with someone or have a meal.

Within the shared wards a number of design features, such as the use of pastel-coloured painted panels and framed images at the head of each bed, helps to soften the ward environment (See Figure 4.16 below).



**Figure 4.16** – Patient bed-bay

**Familiar design: recognisable design that is easily understood and intuitive to use:** This design issue is illustrated by the design of the dayroom, as illustrated in 4.15, which creates a familiar and recognisable environment that is easily used by a person with dementia.

### 4.3.2.3 Support patient safety, wellbeing & health

**Support diet, nutrition and hydration: calm, accessible and usable spaces, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite:** This design issue is helped by availability of the dayroom, particularly with the provision of a dining table and chairs. The calm and spacious nature of the shared wards, along with the provision of bedside seating and overbed tables, provides a setting conducive to eating.

**Support meaningful activities: including physical, social, and activities of daily living (ADLs)** The new dayroom provides a relaxed accessible environment with the flexibility for patients to partake in various activities with visitors or staff (See Figure 4.15).



**Provide contact with nature and access to outdoor space to support active and passive therapeutic activities:** While direct access to outside spaces was not possible in St. Mary's, improvements such as additional planting and bird tables, were carried out to adjacent areas visible from inside the ward. Furthermore, installation of sunflower and fuchsia images at the entrances to the shared patient rooms, provides some degree of visual connection to nature.

#### 4.3.2.4 Balance sensory stimulation

**Optimise positive sensory stimulation (i.e. sunlight, music, artwork, images of nature etc.) while minimising negative stimulation (i.e. noise, glare etc.) as part of a calming and therapeutic approach:** The creation of sensory-supportive environment was one of the main objectives of the St. Mary's Ward refurbishment. In terms of providing positive sensory stimulation, this was achieved through the introduction of nature-based images and local historic photographs of Cork. Within the shared patient rooms the bed-head wall of each bay is painted a soft pastel colour and provided with a framed piece of art.

Minimising negative stimulation centred around minimising visual clutter, reducing noise and avoiding finishes or materials that might produce visual disturbances. The selection of a timber-effect vinyl flooring achieved both of these objectives by providing acoustic absorption and relatively uniform finish without sharp colour or tonal contrasts.



**Figure 4.17** – Entrance to shared patient room

**Support orientation to date, time, location, etc. and improve spatial cognition:**

Orientation to date and time was reinforced with large format calendars and clocks, while orientation to place was strengthened through the local photographs. The use of distinct flower imagery in key locations also helps with orientation, while good colour and tonal contrasts between walls, floors and other key building features or components helps with spatial orientation and cognition.

**Provide good way-finding that supports navigation:** Wayfinding is supported on a number of levels including painting to emphasise or de-emphasise certain components and areas or the provision of clear signage and associated images to reinforce the message.



**Figure 4.18** – Entrance to shared patient room (left) and ED bay

**Provide good visibility and visual access: Optimise lighting conditions and make sure important features (e.g. handrails), spaces (e.g. toilets), and people (e.g. staff) are clearly visible:** Artificial light levels were improved through additional light fittings and the use of higher output light bulbs. The visibility of handrails, furniture, signage, and other key features was improved through greater colour and tonal contrast. At the same time, decluttering provided greater legibility.

#### **4.3.2.5 Adequate space to support the needs of a person with dementia**

**Bays or single rooms with space for personal belongings and adequate room for visitors:** While the constraints of an existing building precluded the enlargement of bays, the existing bays allow some space for visitors, while the bedside lockers provide a small area for a patient’s personal belongings.

**Space for retreat in multi-bed wards (i.e. quiet sitting room for patients and family that can be used as respite from busy ward) and communal areas in single-bed wards to allow social interaction:** The new dayroom, discussed in earlier sections provides both a retreat and interaction space, depending on specific patient needs.

**Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes:** The aforementioned dayroom provides a destination to walk to, and a location for mobilisation and activities. This is further

facilitated by an unclutter central circulation area with supportive handrails and objects of interest in the form of the photographs.

#### **4.3.2.6 Discussion**

The refurbishment of St. Mary's Geriatric Ward and the dementia friendly bay in the emergency department illustrates what can be achieved in an existing setting.

Notwithstanding the success of this project, feedback from key staff involved in these works reveals many challenges such as cost, restrictions due to the existing building fabric, and the need to align with multiple hospital standards, such as hygiene.

### 4.3.3 Connolly Hospital Blanchardstown

Blanchardstown, Dublin 15



**Figure 4.19** – Main Entrance to Connolly Hospital

In the intervening years it has evolved into a major teaching hospital providing services to communities in Dublin, Kildare and Meath. Services include an Emergency Department, acute medical and surgical services, acute psychiatric services, long-stay residential care, day care, and out-patient services. This is an acute general hospital with over 400 beds.

As part of the HSE/Genio Integrated care pathways in the acute hospital sector for people with dementia' project a number of environmental works were carried out in Connolly including: new the toilet signage throughout the hospital signage; and signage, date-and-time clocks in Emergency Department (ED), Acute Medical Assessment Unit (AMAU), and Holly day ward (outpatient department for older people); and substantial works the Rowan ward (older persons ward).

The following section identifies specific design features within these areas that support the various key dementia friendly design issues as highlighted in this current research report.

#### 4.3.3.1 Support engagement and participation

**Promote engagement with friends and family, staff and community:** The Rowan ward, which is a dedicated ward for older people, is part of the original TB sanatorium and therefore, like many such hospitals, the ward has an existing solarium. Over time this solarium was converted into a staff meeting room, but as part of this Connolly's dementia friendly design project, it was converted into a patient lounge, retaining the original name 'Solarium'. This can be used by family members and visitors, and for patient-staff activities. This new addition greatly enhances the level of engagement and participation within the ward.



The provision of tables and seating, a kitchen area, and a TV and music system reinforces this engagement by providing various opportunities for people to do things together. Furthermore, a separate screened seating area to one side provides a more private space for a person to sit alone, or in a small group. This provides choice within the space, allowing someone to be part of a bigger social setting, or to enjoy a bit of privacy or seclusion without feeling too isolated.



**Figure 4.20** – Solarium in Rowan ward, Connolly Hospital

**Provide space and supports so that accompanying persons can remain with the person with dementia, where possible, throughout their time in the hospital:** The solarium described, above provides an ideal space for accompanying persons to either spend time with the patient, speak with staff, or take a break from their caring duties. In this regard, the kitchen provides useful facilities to make tea/coffee, or prepare some food.

**Promote a participatory design approach: all key stakeholders contributing in a meaningful way to ensure their needs and preferences are incorporated into the design process.** The environmental carried out were designed in collaboration with key clinical and facility management staff, patients and family members. Information posters were hung within the ward and hospital alerting people to the proposed works and offering them the chance to submit comments.

### 4.3.3.2 Provide a people-friendly environment

**Soften the institutional environment: more human-scale, less clinical or austere**

**in appearance:** The Solarium is fitted out in a comfortable contemporary manner that provides a relaxed and somewhat homely setting. In other parts of the ward, photographs of local scenes and space for personal belongings, help to soften the overall environment.

**Familiar design: recognisable design that is easily understood and intuitive to**

**use:** The kitchen in the Solarium is fitted with domestic style units and kitchen fittings, and provided with crockery, books and flowers to create a more familiar and home-like setting.



**Figure 4.21** – Kitchen within the Solarium

**Facilitate personalisation: provide opportunities to add personal belongings such**

**as photos to reinforce identity and help with orientation:** Within the patient rooms space has been provided adjacent to the patient beds for personal belongings to help personalise these areas and provide a recognisable identity in terms of orientation and navigation.

### 4.3.3.3 Support patient safety, wellbeing & health

**Provide a safe environment: unobtrusive safety measures that do not conflict with other issues such as privacy or the freedom to engage in physical activities:**

A good example of this design issue is provided by the lighting and electrical socket control panel in the Solarium. These discrete controls allow staff to operate lighting, and disable



certain plugs that may present a hazard for certain users. Furthermore, concealed storage areas in the kitchen provide areas to store objects or materials that might be a hazard.

**Support diet, nutrition and hydration: calm, accessible and usable spaces, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite:** Again, the Solarium and kitchen provide a comfortable, calm and easily understood environment for eating. The glazed panels to the wall mounted kitchen units allow patients to clearly see the crockery inside, which may encourage them to make themselves a hot drink or take a glass of water.

**Support meaningful activities: including physical, social, and activities of daily living (ADLs):** As described previously, the Solarium provides the space and support for social activities and ADLs with the ward.

#### 4.3.3.4 Balance sensory stimulation

**Optimise positive sensory stimulation (i.e. sunlight, music, artwork, images of nature etc.) while minimising negative stimulation (i.e. noise, glare etc.) as part of a calming and therapeutic approach:** A portion of the Rowan ward was part of the original TB sanatorium, where south-facing natural light, views and a calm environment were central to the patient treatment. In this regard, parts of the ward benefit from single-loaded corridors with north-facing glazing (less glare), south-facing patient rooms, and balcony spaces, which lead to a calm and therapeutic environment overall. This is reinforced by the recent dementia-friendly design works such as the refurbished Solarium, the presence of flowers in certain locations, and the display of photographs of local scenes within the corridors.

**Provide contact with nature and access to outdoor space to support active and passive therapeutic activities:** The location of the Solarium provides pleasant views to adjacent trees and the Dublin mountains in the distance. As mentioned above, the portion of the ward that formed part of the previous sanatorium contains a continuous south-facing balcony space running along the length of the single patient rooms. However, due to the current height of the guardrail, it is deemed unsafe for patients to use the balconies independently. Hopefully this will change at some time in the future as this balcony is would provide a significant amenity if patient safety issues were addressed.

### 4.3.3.5 Support orientation and navigation

#### Support orientation to date, time, location, etc. and improve spatial cognition:

In a number of locations, throughout the hospital, time and date clocks have been installed to help patients with temporal orientation. Geographical context is helped through the display of local photographs in the corridor. Moreover, the layout and of the ward, which permits a number of external views and admits considerable natural light, helps to orientate patients towards their local, time of day and season. Spatial cognition and orientation is strengthened visually through the provision of good colour contrast at key junctions such as the skirting boards and doorways.



**Figure 4.22** – Time and date clocks (left) and photograph of local scene (right)



**Figure 4.23** – Corridor in Rowan ward showing colour contrast to skirting and accent colours to patient rooms

**Provide good way-finding that supports navigation:** As illustrated above in Figure 4.23, accent colours are used as visual cues as part of the wayfinding approach to aid navigation for patients. Consistent with many hospital settings, patients unable to find the toilets was identified as a problem in Connolly. Therefore, the provision of new toilet signage along with painting the toilet door reveals yellow as an additional visual cue, were an important part of the wayfinding strategy. Within Rowan ward, and other selected areas, additional signage was installed that gave directions to the nurses' station, the Solarium, and other key patient areas.



**Figure 4.24** – Corridor in Rowan ward showing yellow toilet signage and yellow reveal to toilet door (left) and close up of toilet signage (right)

**Provide good visibility and visual access: Optimise lighting conditions and make sure important features (e.g. handrails), spaces (e.g. toilets), and people (e.g. staff) are clearly visible:** In addition to the measures outlined previously, contrasting colour toilet seats were installed in selected toilets to improve visibility and legibility. New colour contrasting covers were fitted to the handrail section of the bumper rails to help patients identify and locate handrails these vital supports (see Figure 4.24 above). Finally, as described elsewhere, clear glazed panels to the kitchen units enable patients to see the contents without having to open the unit.

#### 4.3.3.6 Adequate space to support the needs of a person with dementia

**Bays or single rooms with space for personal belongings and adequate room for visitors:** Within the single and shared rooms, space has been created adjacent to the patient beds and patients are encouraged to bring in personal items to create a more familiar and easily identifiable space.

**Space for retreat in multi-bed wards (i.e. quiet sitting room for patients and family that can be used as respite from busy ward) and communal areas in single-bed wards to allow social interaction:** The Solarium provides a good retreat space for patients in a shared room, while conversely providing a social space for those in single rooms.

**Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes:** The corridor areas within the ward are a generous width, uncluttered, and are provided with clearly visible handrails for support, thus serving as a suitable space for patient mobilisation. The location of the Solarium to one end of the ward also provides a destination to draw people along the corridor.

#### 4.3.3.7 Appropriate use of technology

**Appropriate use of technology for care delivery, safety or therapy (i.e. sensory stimulation):** While technology was not a major focus of the hospital's efforts, the installation of the lighting and socket controls, along with the provision of a TV and music system in the Solarium, represent simple but effective use of technology in the ward.

#### 4.3.3.8 Discussion

The environmental works completed to date in Connolly demonstrate the role of small scale changes, such as the toilet signage across the hospital, and larger scale changes, such as

the redesign of the Solarium. It is also worth noting that the former sanatorium building, which forms part of the Rowan ward, provide many naturally supportive features and characteristics for people with dementia, perhaps illustrating the patient-centred and therapeutic nature of some sanatoria built in Ireland during the 1950s.

## 4.4. Conclusion

The inclusion of the built environment in the HSE/Genio 'Integrated care pathways in the acute hospital sector for people with dementia' programme, has successfully highlighted the importance of design for dementia in the acute care setting. The works carried out by St. James's Hospital, Mercy University Hospital Cork, and Connolly Hospital respond to many typical problems experienced by people with dementia, their families and staff in Irish acute hospitals.

Issues such as signage, spatial and temporal orientation, and the designation of dementia-friendly ED bays were common concerns in the hospitals, however, the creation of a dedicated family room or patient lounge emerged as a strong theme. It is also noteworthy that while views to nature and outdoor space were an objective across all three hospitals, the provision of a dedicated outdoor space, or direct access to the external environment could not be achieved for various reasons. Considering how access to outdoor space emerged as an important factor for people with dementia in the acute setting, it could be argued that this issue warrants further attention into the future.

While the works in the hospitals were focused on dementia friendly design and largely implemented by staff with expertise in this area, some positive feedback from other staff members and general hospital users illustrates how dementia friendly design has raised the standard of the physical environment for many hospital users.

Finally, bearing in mind that all the interventions described in this chapter were carried out to existing and active hospitals, apart from works in the MISA building, it is encouraging that significant improvements are possible that not only benefit people in terms of dementia, but also many other users in the hospital setting.

# 5.UK Dementia Exemplars

## A review of some recent best practice



Figure 5.1 – Beaconsfield East, Hillingdon, London.

### 5.1 Introduction

In recent years the UK has been a leader in terms of dementia friendly design in many settings and this has spread to the hospital environment. Through organisations such as the DSDC in Stirling, Scotland, or the King’s Fund or the Department of Health in England, a wide range of dementia friendly hospital projects have been undertaken.

The exemplars presented in this chapter are drawn from projects analysed or funded by these organisations and illustrate a wide range of dementia friendly design approaches and features in the hospital context.

### 5.2 Methodology

In order to analyse these exemplars, the Dementia Friendly Design Issues, as discussed in Chapter 3, are used as a framework to interrogate various aspects of the hospital design presented in each case. When certain aspects of the exemplars have a strong connection to the various design issues, they are discussed under that respective issue. Not all issues are dealt with in each exemplar, and in these circumstances, the issue is omitted. Where aspects of the design do not fit with any specific issue, these are discussed as ‘Other Issues’. This facilitates key findings and comparisons to be drawn across the various exemplars.

To ensure that at least some of the key spaces are represented, a range of hospital areas are discussed including: an inpatient ward; a day room/dining rooms; an outpatient clinic; and an external space.



## 5.3 Overview of some exemplar projects

Lulworth Ward in Poole Hospital, Dorset, is a 24-bed acute medical ward caring for older people, where many have dementia or a cognitive impairment. This ward was redeveloped with a focus on creating a calm and orientating space that helps people to operate independently within the ward. Improved signage, lighting, interior colours and the strategic use of art and imagery helps with orientation and wayfinding, while also providing a more welcoming and less clinical environment



**Figure 5.2** – Lulworth Ward in Poole Hospital, Dorset.

The Dementia Assessment Unit (DAU) in Lynfield Mount Hospital, Bradford, in the UK, is a unit with 22 ensuite bedrooms with communal spaces and two courtyards. The ensuite bedrooms have been carefully designed to create a dementia friendly environment with comfortable furniture, good colour contrast, and uniform coloured floors.

(<http://dementia.stir.ac.uk/design/audit-and-accreditation/dementia-assessment-unit-lynfield-mount-hospital-bradford>)



**Figure 5.3** – Ensuite bedroom as part of DAU in Lynfield Mount Hospital.

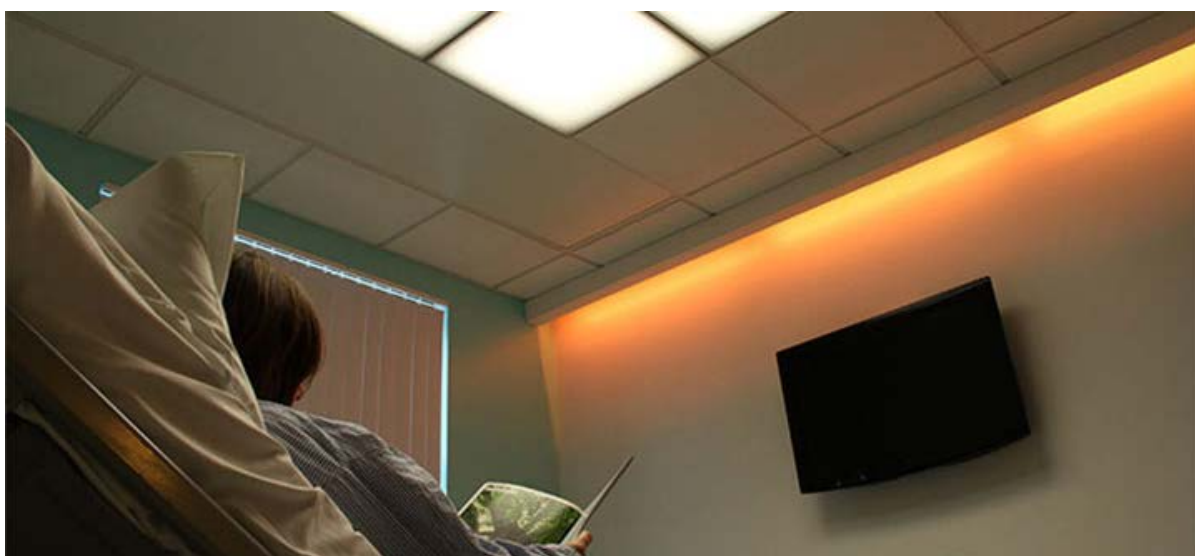


Another Bradford based scheme worth mentioning is Ward 29, which is an older person's ward at Bradford Royal Infirmary. This has been redesigned to incorporate a range of dementia friendly design features. The refurbishment sees a radical transformation from a standard clinical environment to the use of bold accent colours and bright furniture for wayfinding and orientation and memory boxes beside patient beds to allow personalisation. Photographs and digital images of local scenes also help with orientation to place and provide points of interest as a person walks around the ward.



**Figure 5.4** – Refurbished ward corridor in Ward 29 in Bradford Royal Infirmary.

A Philips 'Dynamic Lighting' and 'HealWell' lighting system (Phillips, 2017) are an important part of the dementia friendly design strategy. The Dynamic Lighting system reflects the natural rhythm of daylight within patient rooms and therefore creates bright daylight-like artificial illuminance during the day, which helps with orientation and normal sleeping patterns at night (Waller et al., 2013). The 'HealWell' system also mimics outside daylight conditions, but also contains ambient lighting that can be adjusted by the patient to pre-set scenes, depending on their preferences.



**Figure 5.5** –Philips Dynamic Lighting system in Bradford Royal Infirmary.

Beyond the inpatient ward environment, other areas of the hospital have been redesigned such as the outpatient department (OPD) at the Royal Hallamshire Hospital, in Sheffield, UK. With nearly 500,000 people visiting the OPD each year, and many of these being over 65 years and with a cognitive impairment, it was deemed necessary to redevelop the OPD in line with a dementia friendly design approach. The layout of the department was reconfigured to close down one entry point to create a single entrance with glazed walls to increase visual access, planting and painting to create a distinct entry, and an obvious reception area directly inside the entrance doors. Bold colours, clear signage, and artwork improves orientation and navigation, while natural light and artificial illumination have been maximised to increase visibility and visual access.



**Figure 5.6** –Reception area in the OPD at The Royal Hallamshire Hospital, Sheffield, UK.

The waiting area, as illustrated below, provides a spacious and welcoming space that uses timber flooring and artwork to create a more human-scale and less clinical environment. The seating was carefully selected as part of the consultation process, and the new waiting area provides a more informal arrangement with space for wheelchairs and seating of varying heights to suit a range of needs.



**Figure 5.7** –Reception area in the OPD at The Royal Hallamshire Hospital, Sheffield, UK.

Building on these examples, the next section describes two exemplars in more detail. These projects are sourced from the Health Building Note 08-02- Dementia-friendly Health and Social Environments (Department of Health (UK), 2015). This document describes a number of case studies to illustrate how dementia friendly design had been achieved in a number of healthcare settings, including acute hospitals.

## 5.4 Detailed Investigation of Exemplars

### 5.4.1 Beaconsfield East: In-patient ward

Beaconsfield East, Hillingdon, Greater London, UK



**Figure 5.8** – Shared ward in Beaconsfield East.

Beaconsfield East is a 26-bed rehabilitation ward for older patients and is part of the Hillingdon Hospital in London (<https://www.thh.nhs.uk/about/hill/Beaconsfield-East.php>). Following recent refurbishment to the ward and its garden, Beaconsfield East represents an integrated approach to dementia friendly design across the full spectrum of the ward. The ward is composed of four 4-bedded inpatient rooms, four single-bedded rooms, a day room, a sensory room, a sensory garden, an occupational kitchen, a nurse base, and other support spaces.



**Figure 5.9** – Sitting room in Beaconsfield East.



The following section identifies specific design features that support the various key dementia friendly design issues as highlighted in this current research report.

### 5.4.1.1 Key Dementia Friendly Design Issues

#### A. Support engagement and participation

**Promote engagement with friends and family, staff and community:** As above, the increased space within the room, and the availability of a day room, kitchen, and garden provide space and supports for greater social interaction with visitors.

**Promote a participatory design approach:** The redesign of the ward was carried out in consultation with staff and patient and carer representatives. It is not known if people with dementia were engaged with directly.

#### B. Provide a people-centred environment

**Soften the institutional environment:** The design of the ward, as illustrated in the figures above, is a clear departure from the typical clinical environment and provides a softer and less institutional setting with bright, colourful furniture and spaces.

**Facilitate personalisation:** While there is no explicit mention of personalisation within this ward, such as the memory boxes provided in Bradford Royal Infirmary, the additional space provided for each bed would permit a person to bring more of their personal belongings and thus personalise their individual bed bay.

#### C. Support patient safety, wellbeing & health

**Provide a safe environment:** Patient safety is supported by good observation to all bed bays and the garden from the reception and the nurses base. Non-slip, uniform coloured floors and level door thresholds, coupled with a painting scheme that disguises doors to staff areas, all contribute to safety. The garden is fully accessible and safely enclosed.

**Support diet, nutrition and hydration:** The new day room provides a more natural setting for dining, while the new kitchen space encourages visitors and patients to have a tea or coffee together.

**Support meaningful activities:** Increased space within each room, and the provision of a day room, kitchen, and garden all provide opportunities for activity. In addition, the overall accessibility and supports for mobility, such as handrails, encourages patients to walk around within the ward.

## **D. Balance sensory stimulation**

**Optimise positive and minimise negative sensory stimulation:** The warm use of colour and careful installation of art, coupled with a sensory room, views and access to a sensory garden, combine to provide pleasant sensory stimulation. Meanwhile, less patients per room and the pleasant internal environment conditions create a calm environment that minimises negative stimuli.

**Provide contact with nature and access to outdoor space:** Direct views to the outside and the availability of a safe, accessible sensory garden provides a good level of contact with nature and the elements.

## **E. Support orientation and navigation**

**Support orientation to date, time, location, etc. and improve spatial cognition:** Clear functional zones, careful use of colour, views to the exterior, and the provision of clocks, help support both spatial and temporal orientation.

**Provide good way-finding that supports navigation:** The ward is laid out to improve navigation, firstly the ward is provided with a ‘front of house’ reception design, secondly the ward is provided with a day room at one end and a seating area at the other, to create destination points at each end. Art, colour and signage is also used throughout the ward as part of the wayfinding; this is particularly effective in the bed bays, where distinctive artwork is used to identify each bed space. The garden is also designed using a similar approach, where a looped walkway provides residents with a circular route that takes them back to the starting point.

**Provide good visual access and visibility:** The ward design facilitates clear sight lines for observation, while strong colours and legible signage make navigation easier. Good visibility is helped by high levels of natural light entering each inpatient ward through large glazed doors, while careful design of artificial lighting provides levels of uniform illumination within the ward.

## **F. Provide adequate space to support the specific needs of a person with dementia**

**Patient bays or rooms with space for personal belongings and room for visitors:** The inpatient rooms have been reduced from six to four beds, thus providing more space for each patient, their belongings, and visitors.



**Space both for retreat and communal areas:** The therapy room provides a private space for patients to spend time alone, with staff, or with visitors. In terms of social interaction, the day room provides a social space, while the enlarged patient bays also facilitate more social interaction. The garden space also contains many shaded seating areas that provide opportunities for people to find a quiet space to either retreat to, or sit with other patients, staff or visitors.

**Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes:** The day room, therapy room, and garden all provide space for physical activities. Along with this, the decluttered and clearly legible circulation space within the ward, which is fitted with handrails and provided with destination spaces at each end, promotes and supports patient mobility.

## **G. Appropriate use of technology**

**Appropriate use of technology for safety, care delivery or therapy:** The therapy room contains sensory stimulation equipment such as fibre optics and multimedia technology for visual and auditory stimulation, and reminiscence therapy.

### **5.4.1.2 Discussion**

Beaconsfield East presents a good example of an integrated approach to dementia friendly design across various scales within a ward and adjacent open spaces. An evaluation (Department of Health (UK), 2015) of this redesign demonstrates high levels of patient, staff, and visitor satisfaction, and improvements in certain care outcomes such as reduced length of stay.

## 5.4.2 Darlington Memorial Hospital: Outpatient Department

Darlington Memorial Hospital, County Durham, UK



**Figure 5.10** – Reception area in Darlington Outpatient Department.

The outpatient department (OPD) in Darlington Memorial Hospital receives over 220,000 visitors annually, 60% of these are over 65yrs, while 40% of this number has some degree of cognitive impairment. In line with this, one of the main aims of the redesign was to provide a dementia friendly environment within the OPD through the creation of a calm, welcoming space (Department of Health (UK), 2015). This redevelopment was informed through a consultation process with patients, family members, staff and organisations such as the Alzheimer's Society.

(<https://www.cddft.nhs.uk/news-and-media/latest-news/official-opening-of-dementia-friendly-department.aspx#>)



**Figure 5.11** – Signage in Darlington OPD (<http://www.sarahsnotebook.co.uk/page/2/>)

The following section identifies specific design features that support the various key dementia friendly design issues as highlighted in this current research report.

#### **5.4.2.1 Key Dementia Friendly Design Issues**

##### **A. Support engagement and participation**

**Promote engagement with friends and family, staff and community:** It can be argued that the overall improvement in the OPD creates a better environment for communication between patients, family members and staff within the space. Photographs of local scenes act as objects of interest and can prompt conversations between people, therefore increasing levels of meaningful engagement.

**Promote a participatory design approach:** The redevelopment of the OPD was done in consultation with staff, patients, carers and representative organisations such as Alzheimer's Society.

##### **B. Provide a people-centred environment**

**Soften the institutional environment:** The design of the OPD, as illustrated in the figure below creates a less institutional space with bright, colourful furniture and artwork.



**Figure 5.12** – Waiting area in Darlington Outpatient Department.

**Facilitate personalisation:** While there is no explicit mention of personalisation within this ward, such as the memory boxes provided in Bradford Royal Infirmary, the additional space provided for each bed would permit a person to bring more of their personal belongings and thus personalise their individual bed bay.

### C. Support patient safety, wellbeing & health

**Provide a safe environment:** Flooring without excessive colour or tonal changes, high levels of illuminance, and improved seating has reduced patient slips and falls.

### D. Balance sensory stimulation

**Optimise positive and minimise negative sensory stimulation:** The use of colour, art and photos of local area, and careful natural and artificial lighting provide a positive sensory environment. To minimise negative stimuli, the bright, spacious and welcoming reception and waiting area, generate a calm environment.

**Provide contact with nature and access to outdoor space:** The introduction of ‘suntubes’ in the ceiling to bring in natural light, and the installation of art work depicting natural scenes harnesses the calming and therapeutic influence of nature.

### E. Support orientation and navigation

**Support orientation to date, time, location, etc. and improve spatial cognition:**

The new design provides clearly defined zones, while still maintaining good visual access to key areas. Images of local scenes help to orientate people to where they are, while the careful use of colour and contrast assist people with spatial cognition and a better overall understanding of the space.

**Provide good wayfinding that supports navigation:** As mentioned above the department is broken into distinct zones, yet preserves visual access to key areas, this greatly assists with navigation within the space. The circulation has been reconfigured to provide one main entrance, and the associated reception area is visible upon approach through the glazed entrance, and is placed directly inside the entrance in an obvious location. Art, colour and large format colour coded signage is also used throughout the department and it plays a key role in the wayfinding strategy.



**Figure 5.13** – Colour coding and large format signage in Darlington Outpatient Department.

**Provide good visual access and visibility:** The use of glazed partitions provides good visual access to the reception upon approach, while the open plan reception and waiting area continue this visual access within the department. This arrangement also provides good observation to the waiting area and main circulation areas for the staff stationed at the reception. High levels of illuminance through natural and artificial lighting, combined with colour contrast and colour coding and large format signage contribute to the visibility within the space.



## **F. Provide adequate space to support the specific needs of a person with dementia**

### **Patient bays or rooms with space for personal belongings and room for visitors:**

While this an OPD, and therefore is without inpatient rooms, the overall spaciousness, especially within the waiting area, provide ample space, not only in terms of creating a calm environment, but also in terms of providing space for accompanying persons who may assist the person with dementia. Sufficiently wide doors throughout the department, and large fully accessible toilets with changing facilities, hoist systems and space for two carers to assist an individual in the toilet, all contribute to supporting people with dementia.

**Space both for retreat and communal areas:** Firstly, the spacious and welcoming waiting room provides a good environment for social interaction, while the photos of local scenes provides a spark for conversation between patients, family members and staff.

### **5.4.2.2 Discussion**

Similar to the Beaconsfield East example this redesign illustrate an integrated redevelopment for an entire department, with the resulting evaluation (Department of Health (UK), 2015) showing high levels of satisfaction from of patients, staff, and visitors satisfaction. Data collected to date shows reduced slips and falls among patients.

## **5.5 Conclusion**

This chapter illustrates that the Dementia Friendly Design Issues utilised in the research (which are largely based on the Health Building Note 08-02- Dementia-friendly Health and Social Environments (Department of Health (UK), 2015)) provide a very useful framework. It also demonstrates how the design features and approaches used throughout the various exemplars align with these issues, and that the issues are widely applicable and pertinent to most spaces within the hospital regardless of use.

The case studies reviewed in this chapter range from ED and OPD, to inpatient wards and dementia assessment units. In all cases the emphasis was placed on making the hospital spaces calmer, more welcoming and less clinical or institutional, while also improving patient safety, comfort, orientation and wayfinding. Across the exemplars, this was achieved using carefully selected materials, finishes, colours and artwork, that not only served one function, but achieved multiple outcomes- i.e. the artwork in Darlington was used to orientate people



to their location, to help with wayfinding and navigation, provide the calming influence of nature, or help spark conversations between patients, family member and staff.

The importance of consultation and participatory design comes through as an important fact in achieving successful outcomes in many of the projects. For example, the seating in the waiting area in the OPD at The Royal Hallamshire Hospital was chosen as part of a consultation process and the success of the results may be largely attributable to this process.

Finally, one of the most important findings from these exemplars was the improved care outcomes such as reduced length of stay or the reduction in patient slips and falls.

Furthermore, the positive feedback from patients, family members and staff reinforces that dementia friendly design benefits not only people with dementia or a cognitive impairment, but also visitors and staff of all ages, sizes, abilities and disabilities.

## 6. Contemporary Best Practice: Non-Dementia Specific Exemplars

Emerging best practice and convergence with dementia friendly hospital design



**Figure 6.1** North West Cancer Centre, Altnagelvin Hospital, Derry.

### 6.1. Introduction

The previous chapters looked specifically at case study hospital environments that adopted dementia friendly design approaches in one form or another. While these case studies present invaluable insights, it is also important to look at high quality non-dementia specific contemporary hospital design to understand emerging design trends, and to analyse the convergence and divergence between dementia friendly design and general best practice hospital design.

If this analysis shows that dementia friendly design aligns with current best practice design, then it becomes possible for dementia friendly design to bring benefits to all hospital users, therefore contributing to a more supportive, therapeutic and healthful environment in general.

Furthermore, if this investigation examines the hospitals in their entirety, then it provides an opportunity to examine new-build examples, and also to investigate key design issues across the full spatial spectrum of the hospital.

## 6.2. Overall Aim and Objectives

The aim of this chapter is to review a number of international contemporary case study hospitals to investigate the alignment between best current hospital design and dementia friendly design. Specific objectives include:

- Identify a number of high quality international contemporary acute care hospitals. Firstly, investigate key design elements these across the spatial spectrum, and secondly, analyse the design of these hospitals vis-à-vis the key dementia friendly design issues detailed in Chapter 3.
- Summarise the main design characteristics and features emerging across the hospitals and discuss how these might influence or effect dementia friendly design.
- Determine how closely the key dementia friendly design issues align with good hospital design practice. Illustrate the main convergences and divergences between dementia friendly design and good contemporary design practice.

## 6.3. Methodology

This Case study methodology is largely based on the Standardized Case Study Framework set out by Battisto and Franqui (2014). methodology is broken in five main stages including: 1) Case study scope: Identifying and Selecting Case Studies; 2) Developing a Standardized Framework to collect and analyse data; 3) Collecting data; 4) Analysing Data; and finally, 5) Synthesising and writing up Conclusions. These stages are detailed below.

### 6.3.1. Identifying and Selecting Case Studies

#### **A. Case Studies Scope: Identifying an initial long list of 20 case studies**

- All case studies were either an acute general hospital or a public hospital that provides inpatient and outpatient services.
- The initial long list did not include hospitals that had been specifically designed with dementia in mind, but were selected on the basis of high quality design and because they demonstrated contemporary good design practice.
- The long list represented large, medium and small-scale developments.
- Both green-field new build projects, new-build standalone buildings on existing campuses, and direct extensions to existing hospitals, were included.

- The initial case studies were selected to provide a good international mix of hospitals.

## **B. Selection criteria for final case studies**

- From an initial long-list of 20 hospitals, eight were selected that displayed a strong people-and-patient-centred philosophy that should ultimately benefit people with dementia or an accompanying person. This selection was based on one or more of the following: 1) architectural reviews in established journals; 2) post occupancy evaluations where available; 3) design and healthcare awards; and 4) expert architectural and healthcare design opinion.
- The case studies had to contain at least one example of the categories outlined by the scope above
- Considering that all the hospitals were to be examined across the full spatial scale (Location, Approach, Site Entry and Onsite Circulation; Building Entry and Internal Circulation; Key Internal and External Spaces; Building Components; Internal Environment), case studies were selected where sufficient material was available at these various scales.

### **6.3.2. Case Study data collection and analysis**

Each case study was analysed as follows:

- Data was collected using diagrams, images and notes to capture qualitative data, while plans, sections, elevations, or tables will be used to collect quantitative data.
- Categorised in terms of location, type (i.e. new-build, extension etc), size, and context (urban, suburban, etc).
- Analysis of key design elements at various spatial scales including: Location; Site Approach and Entry; Onsite Circulation; Building Entry; Internal Circulation; Key Internal and External Spaces; Building Components; and where possible Internal Environment.
- How the building responds to the key dementia friendly design issues including: Engagement and participation; A people friendly-centred environment; Support patient safety and health; Balance sensory stimulation; Support orientation and navigation; and Adequate space to support the needs of a person with dementia

- Each case study was scored according to how it performed against each dementia friendly design issue and this is presented in a table to illustrate overall performance in certain areas and to highlight strengths and weaknesses.

## **6.4. Introduction to Case Studies**

The methodology outlined above led to the selection of eight hospitals from the Island of Ireland, UK, Europe, USA, Canada and Australia. They represent hospitals completed in the last 10 years, the oldest opened in 2008, while the most recent was completed in 2017. The selected hospitals are largely general acute hospitals, but the case studies also include cancer treatment and rehabilitation centres as these cater to a large number of older patients. A children’s hospital is also included due to the care invested in creating a therapeutic setting that both softens the intuitional environment and creates meaningful legibility for patients.

The selected case studies are briefly outlined below, while the key findings from these case studies are discussed in the next section. A detailed analysis of these case studies has been prepared and is available at [www.trinityhaus.tcd.ie](http://www.trinityhaus.tcd.ie). However, the key findings from the case studies are outlined in the following sections.



### 6.4.1. Case Study I: South West Acute Hospital, Enniskillen



**Figure 6.2:** Aerial view of South West Acute Hospital in Enniskillen

Associated Organisation: Western Health & Social Care Trust

Associated Campus/Institution: N/A

Geographic Location: Enniskillen, Co. Fermanagh, NI

Building Area: 53,375m<sup>2</sup>

Scale Classification for Study: Large (317 beds)

Building Type: General Acute Hospital - New Building (completed in 2012)

Building Context: Sub-Urban/Rural - Greenfield Site

South West Acute Hospital (SWAH) Enniskillen is a general acute hospital located in Co. Fermanagh, Northern Ireland. At 54,000m<sup>2</sup>, the hospital is categorised as large for the purposes of this study, and its location on a greenfield site approximately 1 mile from Enniskillen puts the building in a suburban/rural context. SWAH is a mid-rise building with an elongated footprint which takes advantage of the openness of the site and surrounding landscape to integrate accessible linear gardens into the hospital's design. This emphasis on landscape is prevalent throughout the building and strongly contributes to the creation of a healthful environment as well as helping to soften the impact of the institutional nature of such a large acute hospital.



SWAH demonstrates a clear internal circulation strategy which supports orientation and navigation within a legible hierarchy of scales, with main hospital circulation distinct from inter-departmental and departmental circulation. Visual connection between circulation spaces and the building's integrated landscape helps to balance sensory stimulation and provides a people-friendly environment.

SWAH has a majority of single rooms, supporting privacy, dignity and personalisation of the patient's immediate environment although there is an opportunity to further develop a 'family zone' within the patient bedroom. Sitting rooms and break out areas with views to the surrounding landscape encourage openness and social interaction, creating a patient and family-friendly environment.

#### 6.4.2. Case Study 2: Southmead Hospital, Bristol



**Figure 6.3:** Aerial view of Southmead Hospital, Bristol

Associated Organisation: North Bristol NHS Trust

Associated Campus/Institution: Southmead Hospital Campus

Geographic Location: Bristol, England

Building Area: 113,000m<sup>2</sup>

Scale Classification for Study: Large (800 beds)

Building Type: General Acute Hospital - New Building (completed 2013)

Building Context: Suburban Campus

Southmead Hospital's Brunel building is a large acute hospital completed in 2014 on Southmead's suburban campus in Bristol, England. At 113,000m<sup>2</sup> the size of this development increases its level of complexity and thus, the challenges associated with designing a clear and navigable, people friendly environment. Despite this, the Brunel building establishes a clear ordering concept with its elongated central concourse, establishing a legible hierarchy of scale within the building, as well as distinct public, clinical, and patient realms. Natural light and views to the outside on circulation routes and in key patient areas support orientation to date and time as well as navigation, and consideration has been given to colour and artwork which provides another layer of spatial cues and landmarks within this large hospital. While landscaped courtyards and gardens provide visual respite from the institutional environment throughout the hospital, it would be of benefit if more of these were accessible to patients as safe, external areas within the building.

Single patient rooms are provided throughout the Brunel building, supporting patient privacy and dignity, while the inboard ensuite arrangement allows clear patient views from the bed to landscaped campus and courtyards. These rooms have a chamfered ensuite to allow for the higher level of patient observation which may be required in an acute hospital environment. The design of the patient room is quite minimal and there is opportunity to increase the provision for patient personalisation or a family zone.

Racetrack corridors on wards support patient mobility and safe wandering, and the policy of small touchdown bases in place of a central, large nurse station ensures staff visibility to patients and patient safety through passive surveillance. Despite its scale and complexity, the Brunel building contains a number of design features which mitigate the potential negative effects of a clinical, institutional building of such a large size. The design supports patients, staff, families and carers and is overall a patient and people-friendly environment although a number of items have been identified which could improve the support for the specific needs of patients with dementia.

### 6.4.3. Case Study 3: Bridgepoint Active Healthcare, Toronto



**Figure 6.4:** Bridgepoint Active Healthcare

Associated Organisation: Bridgepoint Foundation

Associated Campus/Institution: Ministry of Health and Long-term Care, Ontario

Geographic Location: Toronto, Ontario, Canada

Building Area: 51,072m<sup>2</sup>

Scale Classification for Study: Large (472 beds)

Building Type: General Hospital/Chronic Care Hospital - New Building - Tall Building (completed 2013)

Building Context: Urban Healthcare Campus

Bridgepoint Active Healthcare (BAH) is a referral hospital which provides an interim step between acute care and discharge for patients who require rehabilitation and complex care to cope with chronic illnesses. It is significant for the purposes of this study that the mean age of complex care patients at BAH is 62.5 years, and a longer average length of stay means that it is of added importance that the hospital environment is patient and family friendly, and enables patients with a range of abilities and disabilities to remain mobile, active and engaged. At over 50,000m<sup>2</sup>, the hospital is classified as large, and its form as a tall or high-rise block with a small footprint also presents lessons in the area of internal circulation and the integration of landscape in tall buildings.

Although BAH is a single, deep plan block, without internal voids, gardens or courtyards, it achieves an outdoor amenity ratio of 22% by providing accessible terraces and gardens at roof level and to the perimeter of the building. The small building footprint and vertical stacking of accommodation ensures meaningful views to the surrounding landscape from the vast majority of patient areas which are arranged around the perimeter of the plan. The relationship to the surrounding landscape and the integration of accessible landscape into the design is one of the most people-friendly and salutogenic aspects of BAH's design. The communal areas and lower floors of the building encourage engagement and interaction with the broader community and are not overly institutional in atmosphere and this also provides a family friendly aspect to the hospital. However, the upper floors and ward areas are more generic and a greater effort could have been made with the fitments and finishes in this area in order to soften the impact of the institutional environment. Local, small dining-rooms serve each ward as a 'household', encouraging social interaction and helping to ensure that patients maintain the activities of daily living when possible during their stay at the hospital.

As a high-rise hospital, BAH has a clear and repetitive vertical circulation strategy with a single vertical core serving as the linchpin for the scheme. Care is taken to reorientate patients and visitors with consistent views to the outside upon exiting the lift. Horizontal circulation from this core is consistent and legible at every level with racetrack loops supporting safe wandering and good passive surveillance provided by the distribution of Nurse Bases. However, colour and finishes could be more effectively employed to define different zones and create a more legible building for patients and visitors.



#### 6.4.4. Case Study 4: Nya Karolinska Solna, Stockholm



**Figure 6.5:** Nya Karolinska Solna teaching hospital in Stockholm

Associated Organisation: Stockholm County Council

Associated Campus/Institution: Karolinska University Hospital

Geographic Location: Stockholm, Sweden

Building Area: 300,000m<sup>2</sup>

Scale Classification for Study: Large (830 beds)

Building Type: Acute General Hospital - New Building (completed 2016)

Building Context: Urban Healthcare Campus

Nya Karolinska Solna (NKS) is a large acute hospital situated on an urban campus in the Solna district of Stockholm, Sweden. At 300,000m<sup>2</sup>, it is the largest acute hospital reviewed as part of this study. Despite this, NKS performs very well in relation to all key categories; patient and family friendly issues, creating a people friendly environment, supporting orientation and navigation, and balancing sensory stimulation.

Despite being a building of enormous scale, the hospital's size has been carefully broken down into manageable and legible portions, creating a more people friendly environment. This has been done at the scale of the hospital block, as well as within large individual spaces through the use of clustered seating and furniture. Laboratories and diagnostics have been separated into a separate, ancillary building, and a double hospital street arrangement

completely separates staff and service flows from patient and visitor traffic – removing the disruption and distress which can be caused when these flows intersect.

Single patient bedrooms support privacy and dignity and allow for visitors and family members to accompany patients where appropriate. The distinction between the public and clinical spaces is generated within the building with clinical space reading as ‘block’ and the public zones as the voids in between. As a result, the clinical-institutional environment is maintained within clinical areas as is entirely appropriate, while a less institutional, softer and more engaging environment exists in the interstitial zones. This not only leads to a more patient and family-friendly building, but increases the legibility of the hospital environment while allowing for meaningful experiences to take place in the in-between spaces.

#### 6.4.5. Case Study 5: Royal Children’s Hospital, Melbourne



**Figure 6.6:** Royal Children’s Hospital in Melbourne

Associated Organisation: University of Melbourne / Murdoch Children’s Research Institute

Associated Campus/Institution: Royal Children’s Hospital, Melbourne

Geographic Location: Melbourne, Australia

Building Area: 165,000m<sup>2</sup>

Scale Classification for Study: Large (353 beds)

Building Type: Acute General Hospital/Paediatric Hospital - New Building (completed 2011)

Building Context: Urban Healthcare Campus



The Royal Children’s Hospital (RCH) is a dedicated paediatric hospital opened in 2011 in Melbourne, Australia. The building is set in parkland on the urban periphery and at 165,00m<sup>2</sup>, it is classified as large for the purposes of this study. As a paediatric hospital, the building design is aimed at children and young people, however RCH has taken great care to address a number of issues identified as part of the Dementia Friendly Hospitals project, particularly in the area of softening the institutional environment and creating meaningful, legible spaces for patients. Furthermore, there are certain common elements shared between younger and older patient cohorts – in particular the level of dependency which these groups may have on carers and family members.

RCH Melbourne provides a strong example of how positive distractions can be designed into buildings in the form of engaging and meaningful spaces, as well as through landscape, colour and artwork.

Way-finding throughout the hospital is supported by the building layout and a hierarchy of key internal spaces, allowing patients to navigate with reference to the building’s central concourse. Intuitive navigation is further supported by the careful positioning of artwork and the use of colour which also helps to foster a people friendly atmosphere and soften the institutional environment. Natural light, views to the outside and integrated landscape aid orientation to time and place as well as contributing to a healthful, patient friendly ambience.

#### 6.4.6. Case Study 6: Taussig Cancer Institute, Cleveland, Ohio



**Figure 6.7:** Taussig Cancer Institute in Cleveland, Ohio

Associated Organisation: Cleveland Clinic Foundation

Associated Campus/Institution: Cleveland Clinic Campus

Geographic Location: Cleveland, Ohio, USA

Building Area: 35,000 m<sup>2</sup>

Scale Classification for Study: Medium (no inpatient beds but has 126 exam rooms and 98 treatment rooms)

Building Type: Cancer Treatment Centre - New Building (completed 2017)

Building Context: Urban Healthcare Campus

Taussig Cancer Institute was completed and opened in 2017 on the Cleveland Clinic Urban Healthcare Campus in Ohio and at 35,000m<sup>2</sup> is considered to be a medium sized building for the purposes of this study. While the Taussig Centre is not a general acute hospital, the design of the building was deemed to be of interest as it makes significant efforts to reduce patient anxiety and to streamline the patient journey to reduce stress. Furthermore, the nature of cancer care indicates the probability of a higher average patient age, meaning that the environment must be supportive of patients who may have some degree of dementia or cognitive impairment.

The building express an aspiration to create a healing environment and there is a strong emphasis on natural light, particularly in main circulation areas, as well as a high-quality, calming interior design approach, The location of the building on a well organised and legible healthcare campus, and the direct views from the building to the campus 'green spine' also contribute to achieving the goal of creating a salutogenic building and a patient-friendly atmosphere.

The institute is planned and programmed by cancer type, allowing patients to have the majority of their treatment in one particular area with caregivers coming to them. This approach limits the anxiety which can be caused when patients are required to navigate large and complex healthcare buildings, but may be challenging to implement in an acute general hospital. It does however highlight how the planning of departmental adjacencies within healthcare buildings could be considered with reference to common patient flows and journeys. The building organisation and layout supports intuitive navigation with each floor's central foyer operating as a reorientation zone. Single patient rooms ensure privacy, dignity and calm while more open social spaces are available if patients favour social interaction.

### 6.4.7. Case Study 7: North West Cancer Centre, Altnagelvin Hospital, Derry



**Figure 6.8:** North West Cancer Centre, Altnagelvin Hospital, Derry

Associated Organisation: Western Health and Social Care Trust

Associated Campus/Institution: Altnagelvin Hospital

Geographic Location: Derry, Northern Ireland

Building Area: 15,000 m<sup>2</sup>

Scale Classification for Study: Small (Cancer treatment facilities and 27 inpatient beds)

Building Type: Cancer Treatment Centre - New Building, Extension to Existing Hospital (completed 2016)

Building Context: Suburban Healthcare Campus

North West Cancer Center is a new radiotherapy facility at Altnagelvin Hospital in Derry which opened in 2017. At 15,000m<sup>2</sup>, it is considered a small building and is a major extension to an existing hospital campus. The hospital building is designed to respond to natural patient anxieties associated with radiotherapy treatment by establishing a warm and welcoming people-friendly environment and by maximising connections to nature within the building where clinically possible. The hospital also carefully considers patient flow throughout and minimises stress and disruption. Accessible roof gardens are provided at first floor level, providing safe access to a natural environment, fresh air and distant views over the wider landscape.

The centre's design, from its overall layout to its finishes and furniture, ensure that circulation routes are safe, stimulating and legible while consistent views to nature place the building in context. Single patient rooms ensure patient dignity and the built-in family zone in rooms facilitates the continuous presence of family which can be an important source of comfort and stability for patients with dementia.

North West Cancer Centre effectively establishes a 'public realm' within the hospital which is distinct from more clinical areas, providing respite from the institutional environment where possible, and increasing the building's legibility for patients and visitors.

#### **6.4.8. Case Study 8: Akershus University Hospital, Oslo, Norway**



**Figure 6.9:** Akershus University Hospital, Oslo, Norway

Associated Organisation: Southern and Eastern Norway Regional Health Authority

Associated Campus/Institution: Akershus University Hospital

Geographic Location: Oslo, Norway

Building Area: 137,000 m<sup>2</sup> (565 beds)

Scale Classification for Study: Large (Cancer treatment facilities and 27 inpatient beds))

Building Type: Cancer Acute General Hospital - New Building (completed 2008)

Building Context: Suburban Healthcare Campus

Akershus University Hospital is an acute hospital which opened in 2017 in the Akershus suburb of Oslo. It has been described by designers CF Moller Architects as an, 'informal



place with open, comprehensible surroundings orientated towards the patients and their relatives.’ At 135,000m<sup>2</sup> AUH is classified as a large building for the purposes of this study. The hospital’s large and complex environment has been effectively simplified and made legible through the introduction of a large, linear concourse which performs the function of a high-street and establishes a sense of order and hierarchy of scale within the scheme. This space is central to supporting wayfinding and navigation and allows for natural light and views to the outside when deep within the hospital building. The device of the central concourse establishes separate but connected public and clinical zones, creating areas which are less institutional where patients can walk and engage in activities in a safe, internal environment.

## 6.5. Key Findings and Discussion

While the case studies analysed in this report were not designed specifically for patients and hospital users with dementia, they were designed with a strong people and patient-centred ethos. This is demonstrated through holistic and healthful design approaches, major efforts to soften the institutional environment, good legibility and inclusive wayfinding strategies, and many other design features that produce a humane and supportive setting that focuses on the wellbeing of patients, staff, and visitors.

To use the case studies to inform this current dementia friendly design focused research, the final analysis and discussion are structured around the following research questions:

1. In terms of key overall design strategies and design features across the full spatial spectrum of the case study hospitals, what are the overall themes emerging from the case studies. And how might these general themes inform dementia friendly hospital design?
2. How closely are the key dementia friendly design issues aligned with good hospital design practice as illustrated in the case studies. In this context, what are the main convergences and divergences between dementia friendly design and good contemporary design practice?

These issues are now discussed in the following sections.



### 6.5.1. Overall design strategies and design features emerging from the case studies

**A people-centred design approach as well as a strong patient-centred focus:** The case studies demonstrate strong patient-centred design principles that have clearly moved hospital design on from process-driven thinking that was more apparent in the recent past. In addition to patient focus, the case studies also reveal a people-centre approach (Frascara, 2003, WHO, 2018) to create a more supportive and humane environment for all users. In the case study hospitals this results in a softer less institutional environment that is integrated with the local context and more welcoming to the community.

**Healthful and salutogenic environments:** The case studies also illustrate greater consideration about the impact of the built environment on human health and wellbeing. This shows an evolution beyond merely mitigating the negative effects of the hospital environment, towards a more active healthful approach:

“At a general level, the process of supportive healthcare design begins by eliminating environmental characteristics that are known to be stressful or can have direct negative impacts on outcomes (loud noise, for instance). Additionally, supportive design goes a major step further by emphasizing the inclusion of characteristics and opportunities in the environment that research indicates can calm patients, reduce stress, and strengthen coping resources and healthful processes.” {Ulrich, 2001).

In this regard, the case studies promote active healthful design, aligning with the salutogenic approach outlined in Section 2.4. Rather than a pathogenic approach that focuses on what makes people ill, a salutogenic approach focuses on what makes people healthy. Bearing in mind that a sense of coherence, which is underpinned by ‘meaningfulness’, ‘manageability’, and ‘comprehensibility’, is at the core of salutogenics (Becker et al., 2010), it is interesting to see how many of the case study hospitals have worked hard to create locally responsive and meaningful environments that are supportive of user’s needs, and strive to enhance legibility and orientation in what is often a complex environment.

### **Large size of hospitals:**

The case studies illustrate that as acute hospitals become larger, it is possible to manage the impact of the scale and complexity of these buildings through careful massing of clinical blocks, establishing a hierarchy of scale and clear, legible circulation strategies within the building. The most people friendly buildings which have been analysed have a considered approach to grouping accommodation into legible blocks, designing departmental adjacencies with reference to patient flows, wayfinding and navigation, and implementing clear circulation which is legibly reduced in scale from Hospital Street to internal departmental circulation. Many of the buildings which are successful in this regard are extraordinarily large, such as the Royal Children's Hospital in Melbourne. These large size buildings could be considered as a collection of buildings, bound together by a shared internal public realm – a key internal space or concourse from which visitors to the building can orientate themselves.

### **Integration of outdoor spaces:**

It is clear from the case studies that the integration of landscape and outdoor space is becoming increasingly important in best practice design of acute hospital buildings. The benefits of this are multiple; integrating courtyards and fingers of landscape helps to break down the mass and negative impact of large institutional buildings; integrated landscape in the form of courtyards allows for natural light and ventilation to penetrate deep into the building plan; accessible outdoor spaces provide a safe place for patients and visitors to step outside and gain respite from clinical, institutional environments; integration of outdoor space can help to provide meaningful views to the outside from a range of patient areas and greatly support orientation and navigation. All these factors work together to soften the institutional environment and promote a more people friendly atmosphere.

### **Integration of nature:**

Just as the integration of outdoor space has positive effects and creates more patient centred design, considered landscaping and integration of nature within these spaces further enhances their healthful, positive and people friendly qualities. Nature and landscaping provides a strong counterpoint to the more sterile, clinical nature of spaces which are often appropriate in the acute hospital setting. Landscaping can offer visual respite and meaningful views from clinical zones, and accessible landscaped areas can help patient re-establish a sense of balance through contact with the outdoors and the elements.

### **Central public spaces as clear organisation and circulation principles:**

Many of the most successful case study hospitals embrace the use of a series of, or a single central public space which establishes the organisational and circulation principles for the entire scheme. A central, dominant public space, such as the long, full-height concourse which we see in Akershus University Hospital, presents patients and visitors with legible element around which the rest of the building is arranged and broken down into blocks. This central space creates both an internal public realm, and a hierarchy of scale within the building, allowing visitors, patients and staff to navigate more intuitively.

### **Family rooms and social spaces on wards**

In general, the case studies selected have a majority of single patient bedrooms within inpatient areas. Family rooms and break-out spaces for social interaction are generally included on wards, these areas are more successful when distributed and positioned to allow for incidental use and social interaction, rather than being tucked away or requiring a purposeful journey to use them. South West Acute Hospital, Enniskillen provides a good example of a ward layout where social spaces are located centrally with good visual connectivity from both patient areas and to the landscape outside. The racetrack arrangement on wards support patient mobility and wandering with good passive surveillance from nurse touchdown bases, while the position of break-out areas allows less mobile patients to pause and rest along corridors.

### **Single room occupancy:**

As noted above, international best-practice favours a move towards single patient bedrooms and all the buildings studied demonstrate a majority of single in-patient rooms. While this eliminates the potential for social interaction with a room-mate, well planned wards can manage this with the provision of alternative social spaces, and the single-patient bedroom allows patients to retreat with privacy and dignity maintained.

There are three common arrangements for single patient bedrooms and ensuites; in-board, out-board and interstitial. The in-board ensuite positions the ensuite to the corridor side of the room, with the bedroom on the outer edge of the building as in SWAH Enniskillen, Karolinska Institute and the Brunel Building. In this arrangement the shower room acts as a buffer, providing a degree of separation between the patient area and the corridor. This supports patient privacy but can compromise observation of the patient by staff and as a

result some acute hospitals favour a different arrangement. The out-board ensuite arrangement can be seen in Melbourne Children’s Hospital where the ensuite is on the external façade and the patient area of the bedroom is closer to the corridor with unimpeded lines of observation for staff. This works well in the children’s hospital as the area adjacent to the ensuite is used as a family zone and there is a direct view from the patient bed to the outside. In acute adult hospitals, this arrangement often occurs with the ensuite on the same side as the patient bed-head to ensure ease of transfer from bed to WC, and in this case the patient view to the outside can be severely impacted. This would not be considered a patient-friendly or healthful arrangement and meaningful views to the outside, particularly for bed bound patients is an important feature of salutogenic hospital design.

The new cancer centre at Altnagelvin Hospital is a good example of the interstitial bedroom and ensuite arrangement – where two ensuites are arranged between pairs of rooms. This allows for both good observation from the corridor and good views to the outside although it requires a greater length of façade to achieve the same number of bedrooms. It should be noted that in high observation areas of acute hospitals this room arrangement may be preferred as it allows for glazed screens between the corridor and the room. This may impact upon patient privacy and could be distressing for patients with dementia as activities in the corridor will be more visible – the issue of privacy vs. patient safety and observation is one area of tension which can be identified in the design of acute hospitals.

### **Less large scale or centralised nurse stations:**

A number of the case studies demonstrate a move away from the practice of having large centralised nurse stations on wards. Smaller stations and touchdown bases, distributed more widely improves both passive surveillance of corridors and rooms and the visibility of staff by patients. Less centralised workstations ensure that staff circulate rather than congregate, and wards can be designed so that clusters of rooms can be directly observed from each station.

However, there is also an argument to made for centralised nurses stations providing a strong base or anchor within the ward, while also providing a meeting point for staff. This may have peer-to-peer support, learning or social benefits.

### **6.5.2. Convergence and divergence between dementia friendly design and good contemporary design practice?**

In general, keys aspects of good dementia inclusive design have been identified as:

- creating a people-friendly environment,
- designing with a strong patient-centred focus,
- softening the institutional environment when possible,
- designing healthful rather than pathogenic environments,
- the integration of nature and outdoor spaces, and making these spaces accessible to patients, staff and the public where possible,
- designing legible buildings with clear, central public spaces and legible circulation routes.

The above points can clearly also be identified as central elements of good contemporary design practice for institutional buildings, healthcare developments, and acute general hospitals. Therefore, there is good convergence of key issues for dementia and good design practice in general. However, some points of tension do exist between good, contemporary, patient-centred design and the requirements of the acute hospital environment. The case study buildings offer some insight and suggestion as to how these divergences might be managed through the design process.

One point of divergence is referred to above in the section on in-patient bedrooms. This is the potential conflict between the need for high levels of observation of certain patient cohorts in acute hospitals, and the importance of supporting the patient's dignity and sense of privacy during their stay. It has been noted that the in-board ensuite layout provides a visual and acoustic buffer to ward corridors, but that this can also impede patient visibility to staff, particularly when the bedhead is on the same wall as the ensuite. In-board ensuites can be angled or chamfered to allow for better visibility from the corridor, and the design must strive to strike a balance between privacy and an appropriate level of visibility.

A second point of divergence, and possibly the most significant is the need to soften the institutional environment, and the impact of stringent infection control requirements which are policy in acute hospitals. The reason for this is that infection control has a strong influence on the materials, fittings and finishes which can be used within hospitals and these elements can really inform the impact of the institutional environment for better or worse.

Infection control standards rightly dictate that the materials used in hospital are anti-microbial, cleanable with appropriate products, and without ledges, joints and areas which can collect dirt and dust. This means that's designers in acute hospitals are often encouraged to default to a range of tried and tested finishes which are unfortunately synonymous with the most 'institutional' of environments.

The case study buildings all demonstrate effective ways in which this issue can be managed. The integration of landscape and meaningful views to the outside can provide respite from the institutional environment in more clinical areas, while many of the most successful hospital buildings strive to establish an internal 'public realm' which is distinct from more clinical zones, in which a broader range of materials, fittings and finishes can be appropriately used.

It is positive to note that while areas of tension may exist, there are good precedents available to demonstrate how these conflicts have been managed through design, accommodating clinical needs and important hospital policies, while keeping the patient at the centre of the design process.

## **6.6. Conclusion**

This chapter identifies some key themes that are emerging in best practice contemporary design. It illustrates that many of these themes are beneficial for dementia, but that there are also certain issues such as single rooms that need to be carefully considered in the context of older people and people with dementia who may benefit from the social interaction provided in a shared room.

This chapter also illustrates how good people centred and patient-centred design naturally aligns with and supports many dementia friendly design issues. Furthermore, it can be argued that if the areas highlighted as weak in terms of dementia friendly design were strengthened, it would improve the overall performance of the hospital for all users. Furthermore, the investigation of the case studies across the full spatial spectrum of the hospital has provided important insights regarding location, campus layout, and other aspects of hospital design relevant to dementia, that are not often covered by reviewing dementia specific case studies.



# 7. Building Analysis Case Studies

## Onsite analysis of three Irish Hospital Case Studies

### 7.1 Introduction

A major component of this research involves a detailed Building Analysis of Tallaght, Naas and Peamount Hospital to examine how people with dementia and their carers interact with a typical hospital environment. These building analysis case studies examine the hospitals through a number of spatial scales, from large-scale issues regarding location or site, down to small-scale issues such as internal environment or furniture and fittings.

### 7.2 Building Analysis

The **Building Analysis** was conducted in three phases: Phase I, involved a preliminary assessment to get an overview of each hospital and to identify key focus areas; Phase II involved a more detailed onsite examination; and Phase III, which brought the data together for overall analysis and synthesis.

#### Phase I (offsite & onsite)

1. **Initial on-site evaluation/initial orientation** to get overview of the hospital
2. **Architectural Plan analysis** to understand the overall layout and key areas
3. Ascertain **main onsite patient movement**
4. **Stakeholder Mapping** to locate and select key stakeholders

#### Phase II (onsite)

5. **Attend Outpatients Clinic, Case Study Conferences etc.** to better understand operations of the hospital.
6. **Onsite analysis- Data gathering:** dimension taking; people counting; Occupant behaviour mapping
7. **Stakeholder Engagement: Interviews and questionnaires**

#### Phase III (offsite)

8. **Onsite analysis-Data Synthesis**
9. **Thematic Analysis of Stakeholder Engagement:** Data analysis, synthesis and production of key findings through Thematic Analysis
10. **Overall discussion and conclusion**

## 7.3 Onsite Analysis of the Built Environment

### 7.3.1 Introduction

The onsite analysis allowed the research team to gain first-hand experience of the hospitals, and to fully understand the physical environment in a practical manner. It also helped in understanding the patient experience and their day-to-day interactions with the hospital built environment. This onsite analysis, which is now described in the following sections, informs the overall research and helps place the stakeholder engagement and subsequent thematic analysis in context.

### 7.3.2 Onsite Analysis Methodology

As outlined in 5.2 previously, the onsite analysis is part of a larger building analysis framework dedicated to gaining a deeper understanding of a specific site. This onsite analysis methodology adopted for this research is outlined below.

#### 7.3.2.1 Data Collection

##### A. Onsite Walk-through

Before the onsite survey commenced, a walk-through of each space was carried out in the presence of a senior staff member, to orientate the research team and provide commentary about the space and how it works.

##### B. Onsite Survey

Following this walk-through, the research team immediately returned to key spaces to observe the space and occupants in greater detail, and to take photographs, key physical measurements (where required) and notes regarding specific aspects of the environment.

#### 7.3.2.2 Data Analysis

The data has been analysed based on a spatial framework that consists of: Site Location, Approach, Site Entry and Onsite Circulation; Building Entry and Internal Circulation; Key Internal and External Spaces; Building Components; and Internal Environment.

Data was collected and compiled regarding the relevant design features and attributes across the various spatial scales of the hospital, and is presented through architectural drawings, notes, and photographs for each key area of the hospital. These are used to underpin the thematic analysis, and inform the key findings in the final section of this report.



# Tallaght Hospital Dublin 24

## 7.4 Tallaght Hospital

Tallaght hospital brings together the Adelaide and Meath Hospital Dublin and incorporates the National Children's Hospital and St. Loman's. Built in 1998, the hospital has a catchment population of approximately 450,000 people, predominantly Tallaght, Clondalkin, Firhouse, Rathfarnham, Terenure, Templeogue, and parts of Co Kildare and Co Wicklow.

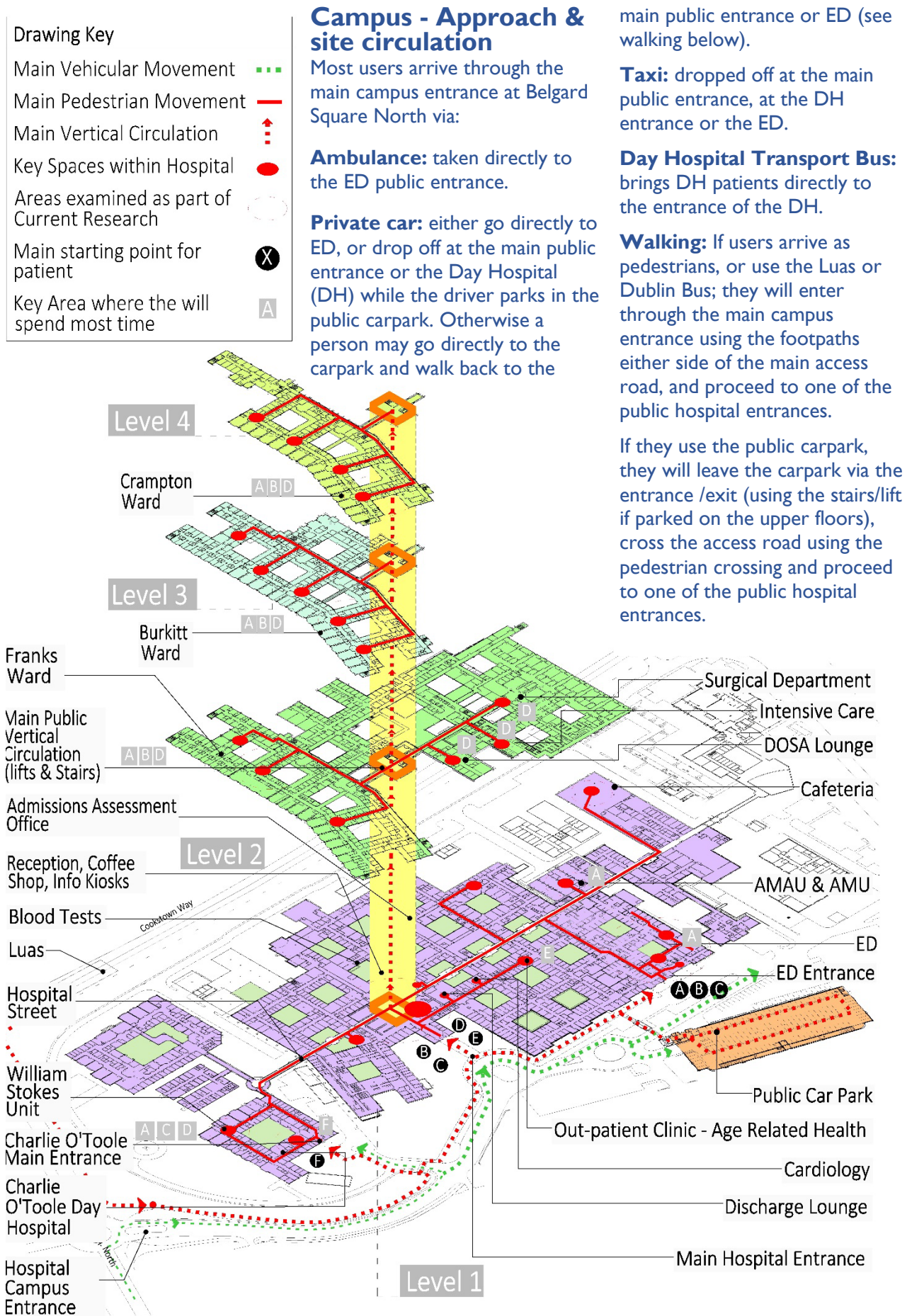
The hospital sits on a 12-hectare campus, has a floor area in excess of 120,000m<sup>2</sup> that is spread over four floors, contains over 500 beds and approximately 3000 staff, and provides child-health, adult, psychiatric and age-related healthcare on one site. The hospital campus is adjacent to the centre of the suburb and is well served by public transport.

Section 7.4.1 below describes the main areas of the hospital and key movement patterns of older patients and visitors within the hospital (See Figure 7.1 below). Following this, Sections 7.4.1.1 to 7.4.1.6 briefly describe the built environment across the key spatial scales, firstly, stepping back out to the scale of location approach and entry, then moving back in along the spatial scales, finishing with components and internal environment.

### 7.4.1 Main Hospital Areas and Key Movement Patterns of Older Patients

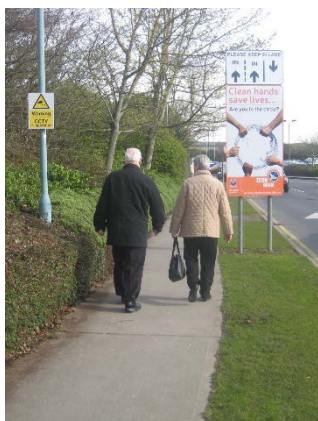
The main areas identified include: main approach areas outside the campus boundary, the main public site circulation areas including the carparks, the ED; the Acute Medical Assessment Unit (AMAU) and the Acute Medical Unit (AMU); a number of general medical wards; the William Stokes Ward (stroke related); the age-related outpatients clinic (i.e. OPD); the Charlie O'Toole DH, and others. In addition to highlighting these key areas, Figure 7.1 also discusses how patients move through and interact with these spaces.





**Figure 7.2:** Key hospital spaces

## Hospital Interior - Key User Movement



### A - ED & AMA / AMU Patient

Patient movement depends on acuity, but patients typically enter via the ED Entrance, present at reception, go to the waiting room or directly to triage, return to waiting room or straight to assessment rooms or treatment bays. While they are being treated within the ED they may go to the ED X-Ray Department or other diagnostic tests but will spend most of their time in one of the bays or on a trolley near the main staff base.

From the ED, and depending on their medical needs, they will either be discharged and go out through the main entrance, go to the AMAU, or directly to one of the in-patient wards or the Stokes Unit.

Once a patient reaches the AMAU they are assessed and either sent to the adjacent AMU or on to one of the in-patient wards.

### B - General Medical Ward Patient (e.g. Crampton)

Patients typically arrive from the ED, the AMAU/AMU or another in-patient ward. Depending on their mobility they will spend their time within their shared or single room, moving about the ward, or in some cases traveling to other parts of the hospital such as the cafeteria or shop.



### C - William Stokes Ward Patient

This ward is split between the stroke unit (8 beds) and the geriatric unit (18 beds) dedicated to the treatment of people over 65 years. While on this ward patients can use the ward day room and dining room. receive rehabilitation within the ward, go to other parts of the hospital for diagnostics, or use the cafeteria or similar in the main hospital.

### D - Elective Patients (overnight & day-case patients)

Patients arriving for elective procedures will arrive through the main entrance, go to Admissions Assessment Office, and from here are taken up the Day of Surgery Admission (DOSA) Lounge in the Surgical Department. If they are a day-case patient they will be discharged via the discharge lounge later that day, if they are to main overnight they will be admitted to one of the in-patient wards, and discharged from that ward via the discharge lounge at the appropriate time.

### E - Age-Related Outpatient (memory & non-memory related)

Patients typically enter through main hospital entrance and proceed to Suite 1 and 2 where the Age-Related Out-patient is held. On their first visit they may go to other parts of the hospital for various diagnostic tests (e.g. cardiology, X-Ray, Phlebotomy) and then return to the clinic too see the medical team.



### F - Charlie O'Toole Day Hospital

Patients arrive to the day hospital by hospital bus or car, enter through the main day hospital entrance, and spend up to 5 hours in the unit. During this time, they will be taken to various treatment or assessment rooms within the ward or travel to the main hospital for diagnostic tests. However, most of their time is spent within the day hospital dayroom.

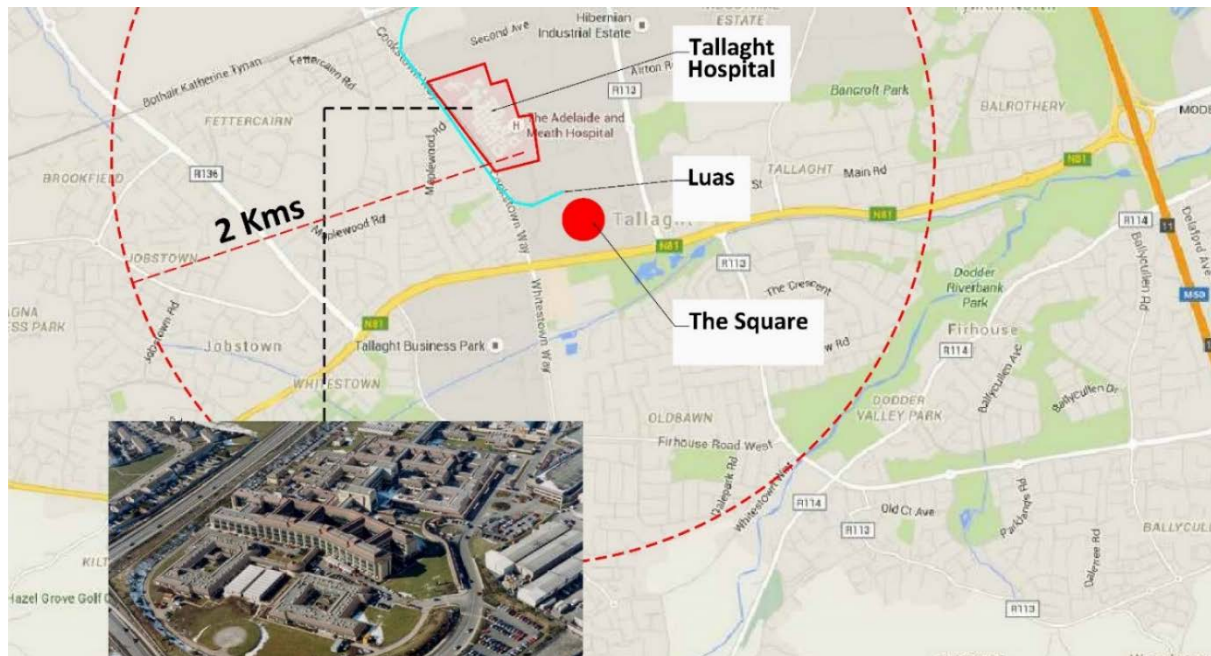
### G Visitor

An older person coming to the hospital as a visitor may use all the main public spaces and also travel to various main in-patient wards in the hospital. Depending on the condition of the patient they are visiting, the visitor may only be able to visit the in-patient wards during visiting hours, or in some cases, if it benefits the patients, they may visit outside these hours and assist with meals or other activities.



The following sections discuss these spaces and circulation within the context of the various spatial scales as presented in Figure 7.1.

#### 7.4.1.1 Site Location, Approach and Entry



**Figure 7.2:** Hospital location

Tallaght hospital is located close to Tallaght town centre in Tallaght Dublin 24 with easy pedestrian, cyclist, and vehicle access to key areas with central Tallaght such as the Square and Main Street. It is well served by public transport including Dublin Bus and the Luas light rail. It is approximately 0.5 kilometres from the Luas stop to the main hospital entrance, while the distance from the bus stops to the entrance is 0.3 kilometres. The hospital campus contains one main site entrance located to the south along Belgard Square North. The entrance is marked by a large covered entrance gateway that provides a strong landmark and obvious entrance point clearly visible on approach.

#### 7.4.1.2 Site Layout and Onsite Circulation

The hospital is primarily composed of one large building that takes up a large area of the site, with the balance of the site given over to car parking, access roads and pockets of green space. The key parts of the site to be examined in this research include: the main access road and associated footpaths, and the multi-storey carpark and associated pedestrian route from the carpark to the main hospital.



**Figure 7.3:** Main entrance road (left) and public carpark (right).

#### 7.4.1.3 Overall building entry, internal circulation and public common areas

The hospital is provided with a number of entry points including: the main entrance located at the centre of the hospital; the ED entrance located to the north of main entrance, and the entrance to the William Stokes Unit, to the south of the site nearer campus entry gate.



**Figure 7.4:** Main Hospital Entrance.

Directly inside the main entrance a three storey foyer space provides the main entry area, containing a range of public facilities such as the reception, coffee shop, waiting areas, stairs and lifts.

The internal layout of the hospital is based on an orthogonal grid of corridors organised around a series of courtyards and tied together with a central hospital street that runs the full length of the building. This internal street is over 340m or 0.34 of a kilometre in length, has an average width of 3.5m, and serves as the main circulation spine within the building. Due to this role, the street is heavily trafficked by various users including visitors, patients, medical staff and service staff.



**Figure 7.5:** Hospital street used for movement of patients (left) and services (right).

#### 7.4.1.4 Key Internal and External Spaces

Tallaght Hospital contains a range of departments and units such as the ED, AMU, OPD, the Geriatric Department (including the DH and the William Stokes Unit), and the Psychiatric Department. In addition to these sections of the hospital there is a number of inpatient wards on the upper floors composed of both specialised wards such as renal care or intensive care, and general non-surgical wards for less acute patients.



**Figure 7.6:** Hospital layout featuring key areas





**Figure 7.7:** ED Reception (left) and ED Waiting Room (right).



**Figure 7.8:** AMAU assessment bays (left) and AMA bed bays (right).



**Figure 7.9:** Entrance along main section of T-shaped corridor showing nurses station ahead at T-junction (left) and 6-bed room (right).





**Figure 7.10:** Main corridor OPD (left) and OPD reception and waiting area (right).

The Geriatric Department which primarily contains the Charlie O’Toole age-related day hospital and the William Stokes Unit, which contains a stroke unit (8 beds) and the geriatric unit (18 beds) dedicated to the treatment of people over 65 years. Both units share an entrance (see Figure 7.11), a reception area, and a courtyard garden.



**Figure 7.11:** Reception area (left) and courtyard garden (right).



**Figure 7.12:** Main corridor in William Stokes Unit (left) and 4-bedded ward (right).

### 7.4.1.5 Building Components

During the onsite building analysis a number of features were identified that formed a significant part of people's daily interaction with the hospital. External issues included footpaths and pedestrian crossings, site signage, or the absence of external seating (see Figure 7.13 below). Important threshold comprise features such as main entry doors (see Figure 7.14).



**Figure 7.13:** Site based building components.



**Figure 7.14:** Main entrance door- Central revolving door with swinging doors either side.

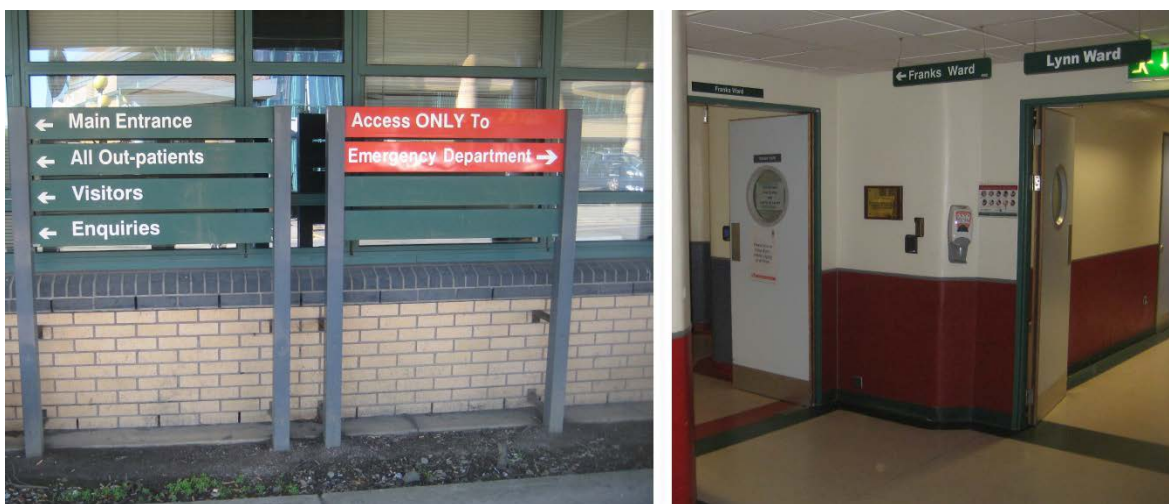
Some of the main internal components include seating, internal doors, bathroom fittings, or artwork (see Figure 7.15). Internal features such as handrails are also another salient component and it notable that William Stokes unit, which caters specifically to older people, is one of the few areas in the hospital that is fitted with handrails (see Figure 5.29).





**Figure 7.15:** Various Components including seating, drinking fountain, toilet and artwork.

Signage is a major building component that spans across all spatial scales and was observed to play a major part in how users interact with the hospital. (see Figure 7.16). Under certain lighting conditions, there was significant reflectance from some of the signage, which may cause problems for some people with visual impairments. Internally, much of the signage is quite small, while its location at a high level may not be in the line of vision for many older people who may be prone to a downward gaze.



**Figure 7.16:** External and internal signage.

#### 7.4.1.6 Overall Internal Environment

When conducting the onsite analysis, and during initial discussion with stakeholders, a number of issues were identified including space heating, lighting conditions, noise, space heating, and internal air quality.

Space heating in the hospital is primarily provided through wall mounted flat panel radiators. Ventilation to the public areas, circulation spaces, and main patient areas, such as the

inpatient wards, is largely provided via openable windows along the external walls of the hospital facing the internal courtyards or the outside of the building.

In general, the hospital is well lit with natural light due to the presence of large open internal courtyards and high levels of glazing throughout the building. However, some locations within the hospital, such as the south facing inpatient wards on levels 2 to 4, can experience excessive heat gain and glare due to their orientation and proportion of external glazing.



**Figure 7.17:** South facing windows to in-patient wards.

Internal air quality is an important environmental condition and is often associated with odours within the hospital. In this regard, the hospital performs quite well with good levels of ventilation provided to the main public and patient areas and this is reported in the next section.

The issue of noise is another key factor in hospitals and is heavily influenced by building design, materials, and finishes. In Tallaght Hospital the volume of traffic on the main hospital street, coupled with the relatively narrow width of the space, creates conditions where noise can be an issue. As might be expected, ED can be perceived as a noisy space, particularly at peak operation. The inpatient wards, especially the shared 6-bedded wards, are also prone to high levels of noise, especially during medical rounds, mealtimes, and visitor hours.





NAAS  
GENERAL  
HOSPITAL

- MAIN ENTRANCE →
- EMERGENCY DEPARTMENT →
- AGE RELATED DAY HOSPITAL →
- PHYSIOTHERAPY →
- DAY SERVICES →

MAIN ENTR



# Naas Hospital Naas, Co. Kildare

## 7.5 Naas General Hospital

Naas General hospital started out as workhouse in 1848, and became Naas County Hospital in 1922. Following a series of major developments starting in the late 1980s, Naas is now a 243-bed HSE run hospital and contains an emergency department, outpatients' department, an age-related day hospital, a psychiatric unit, and other healthcare facilities. The hospital sits on a 5.25-hectare campus, has a gross floor area in excess of 28,000m<sup>2</sup> distributed over four floors.

The following sections describe the key spatial and physical features of the hospital, its campus, and adjacent public spaces. To frame this site investigation within the context of this study, we first outline the key movement patterns of older patients and visitors within the hospital (See Figure 7.18 below). Following this, Sections 7.5.1.1 to 7.5.1.6 briefly describe the built environment across the key spatial scales, firstly, stepping back out to the scale of location approach and entry, then moving back in along the spatial scales, finishing with components and internal environment.

### 7.5.1. Main Hospital Areas and Key Movement Patterns of Older Patients

The main areas identified include: key approach areas along Craddockstown Road, public onsite circulation areas including the carparks, main public entrances and internal circulation areas; the ED; and the outpatients clinic, a number of general and specialised medical wards; the age-related Day Hospital, and others. In addition to highlighting these key areas, Figure 7.18 also discusses how patients move through and interact with these spaces.



Drawing Key

- Main Vehicular Movement .....
- Main Pedestrian Movement ———
- Main Vertical Circulation ⋮
- Key Spaces within Hospital ●
- Areas examined as part of Current Research ⋯
- Main starting point for patient X
- Key Area where the will spend most time A

### Campus - Approach & site circulation

Most users arrive through the main campus entrances along Craddockstown Road via:

**Ambulance:** taken directly to the ED public entrance.

**Private car:** either go directly to ED, or drop off at the main public entrance or the Day Hospital (DH) while the driver parks in the public carpark. Otherwise a person may go directly to the carpark and walk back to the

main public entrance or ED (see walking below).

**Taxi:** dropped off at the main public entrance, at the DH entrance or the ED.

**Walking:** If users arrive as pedestrians, they enter through one of the entrances along Craddockstown Road, and proceed to one of the public hospital entrances.

If they use the public carpark, they will walk across the carpark and proceed to one of the public hospital entrances.

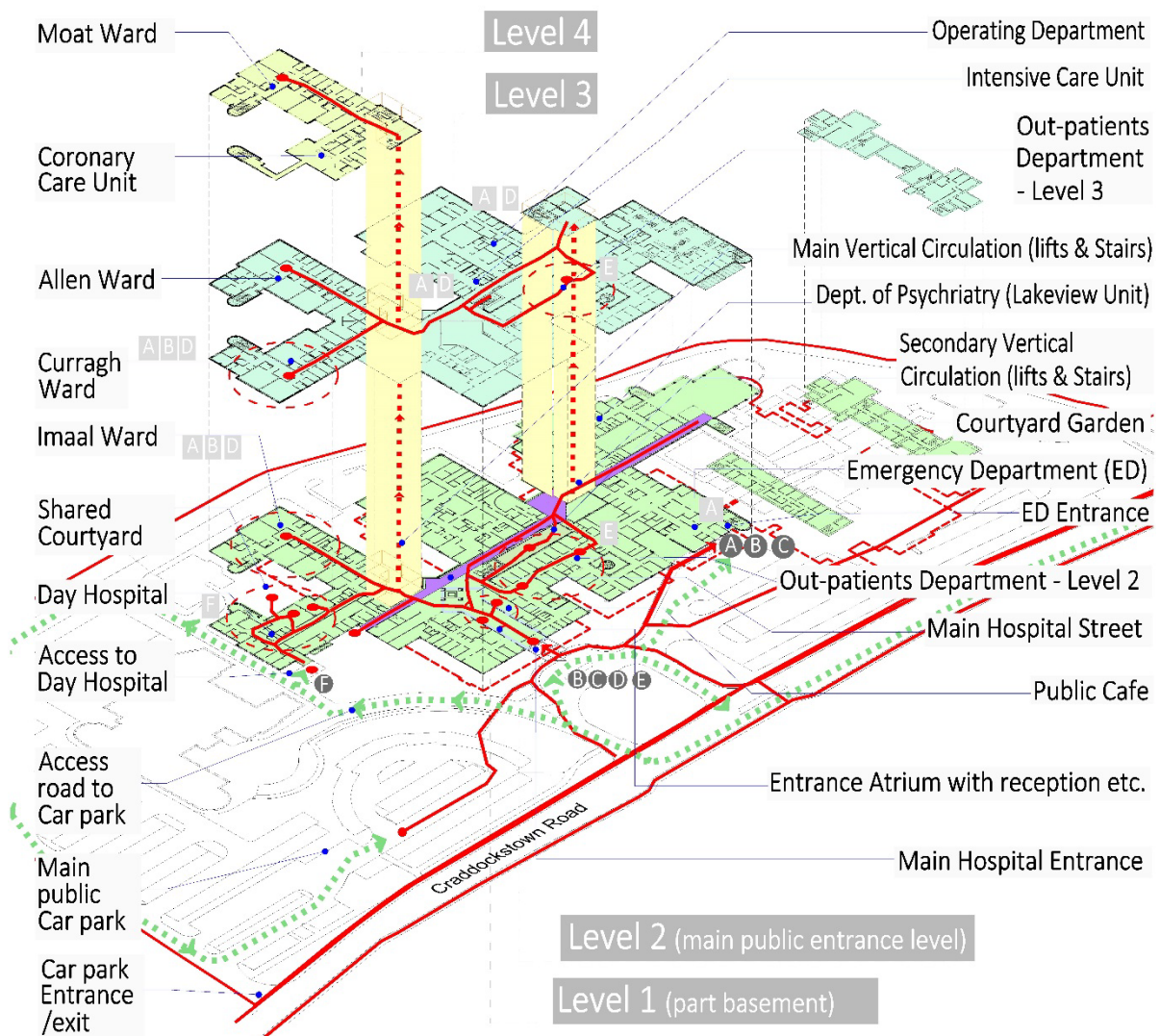
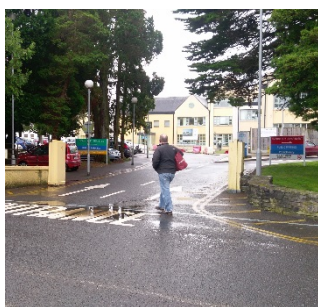


Figure 7.18: Key hospital spaces



## Hospital Interior - Key User Movement

### A - ED



Patient movement depends on acuity, but patients typically enter via the ED Entrance, present at reception, go to the waiting room or directly to triage, return to waiting room or straight to assessment rooms or treatment bays. While they are being treated within the ED they may go to the ED X-Ray Department or other diagnostic tests but will spend most of their time in one of the bays or on a trolley near the main staff base.

From the ED, and depending on their medical needs, they will either be discharged and go out through the main ED entrance, go to the surgical department, or go directly to one of the in-patient wards such as the Imaal Ward.



### B - General Medical Ward Patient (e.g. Curragh)

Patients typically arrive from the ED, the Operating Department, or another in-patient ward. Depending on their mobility they will spend their time within their shared or single room, moving about the ward, or in some cases traveling to other parts of the hospital such as the cafeteria or shop.

### C - Imaal Ward Patient

This ward is dedicated to the treatment of people over 65 years. While on this ward patients can use the ward day room and dining room. receive rehabilitation within the ward, go to other parts of the hospital for diagnostics, or use the cafeteria or similar in the main hospital.

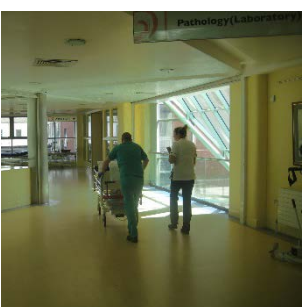


### D - Elective Patients (overnight & day-case patients)

Patients arriving for elective procedures will arrive through the main entrance, Operating Department Reception, and then be taken by a staff member to the appropriate location to start the procedure. Following their surgery they will be taken to the Recovery Ward within the department. If they are a day-case patient they will be discharged that day, if they are to remain overnight they will be admitted to one of the in-patient wards, and discharged from that ward at the appropriate time.

### E - Outpatient

Patients typically enter through main hospital entrance and proceed to the Outpatient clinic. On their first visit they may go to other parts of the hospital for various diagnostic tests (e.g. cardiology, X-Ray, Phlebotomy) and then return to the clinic to see the medical team.

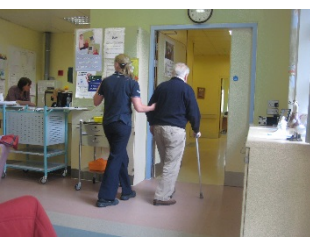


### F – Age Related Day Hospital

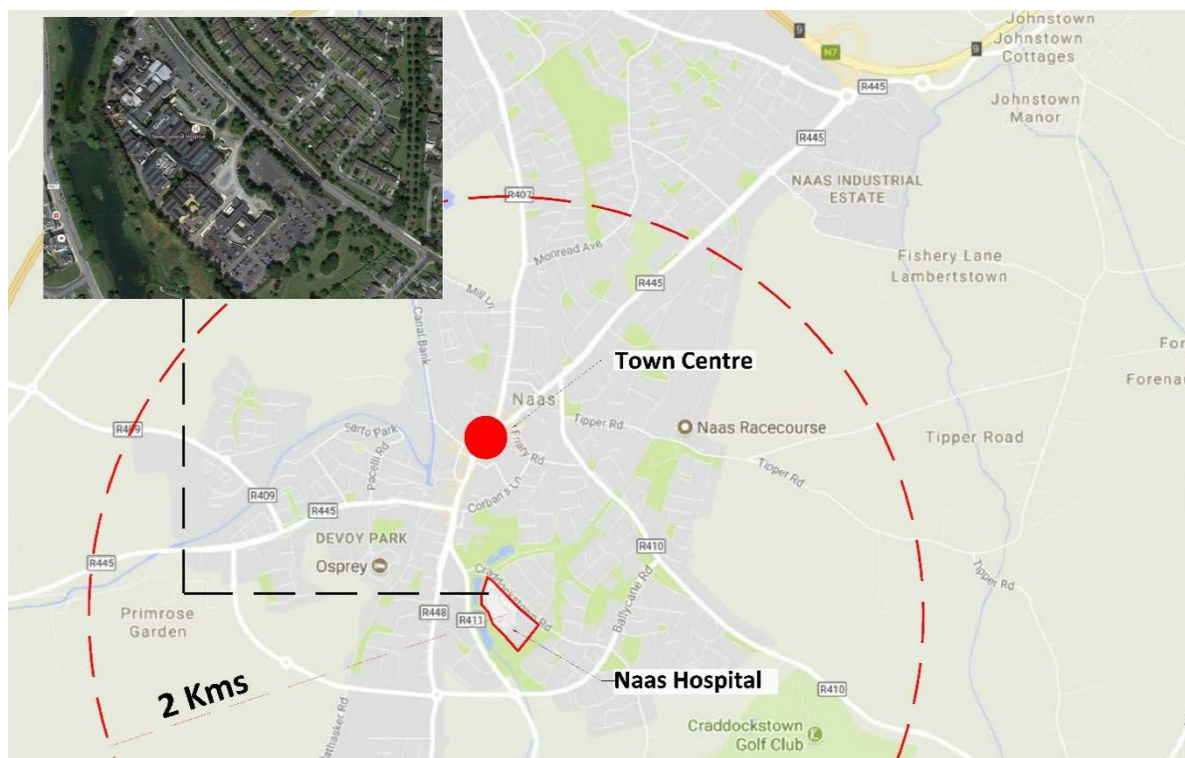
Patients arrive to the day hospital by taxi or private car, enter through the main day hospital entrance, and spend up to 5 hours in the unit. During this time, they will be taken to various treatment or assessment rooms within the ward or travel to the main hospital for diagnostic tests. However, most of their time is spent within the day hospital dayroom.

### G Visitor

An older person coming to the hospital as a visitor may use all the main public spaces and also travel to various main in-patient wards in the hospital. Depending on the condition of the patient they are visiting, the visitor may only be able to visit the in-patient wards during visiting hours, or in some cases, if it benefits the patients, they may visit outside these hours and assist with meals or other activities.



### 7.5.1.1 Site Location, Approach and Entry



**Figure 7.19:** Hospital location

Naas General Hospital is located within 1 km of the centre of Naas town and is primarily reached via a number of pedestrian and vehicle access points along Craddockstown Road. The hospital is also served by a limited local bus service which runs along Craddockstown Road. The hospital campus is flanked to the west by a park with large lakes, this park also wraps around the north and south of the site.

### 7.5.1.2 Site Layout and Onsite Circulation

Naas hospital is largely composed of a series of interconnected buildings located in the centre of the site with the public onsite circulation roads and parking wrapping around the main building. For the size of the site, it could be argued that the vehicle circulation routes are quite complex and the pedestrian route from the main carpark to the entrance does not have a clear and easily identifiable route.



**Figure 7.20:** Main entrance road (left) and public carpark (right).

### 7.5.1.3 Overall building entry, internal circulation and public common areas

The hospital is provided with a number of main public entry points including: the main entrance located towards the centre of the hospital; the ED entry located to the north of main entrance, and the entrance to the Age-Related Day Hospital, which is positioned to the south of the main entrance. There is also a public entrance to the Day Ward and Pre-Assessment Unit, this is located in the old hospital to the north of the ED.



**Figure 7.21:** Main entrance (left), ED entrance (middle), Day Hospital (right).

The masterplan for Naas Hospital that was initiated in the late 1980s redeveloped the hospital in a way that tied the existing and new buildings together through the use of a 'hospital street that operates over three levels. This connecting street has accommodation along either side and in this way provides a central organising and orientation space within the building. The street is over 130m long, on average 3.5m in width and more or less runs the full length of the hospital.

The street is accessed via a two-storey glazed atrium placed at a right angle to the street and forms the main entrance space and contains the reception, café, and a central seating area. There are two main vertical circulation areas, containing stairs and passenger lifts, these are located to the rear of the atrium, or mid-way along the hospital street.

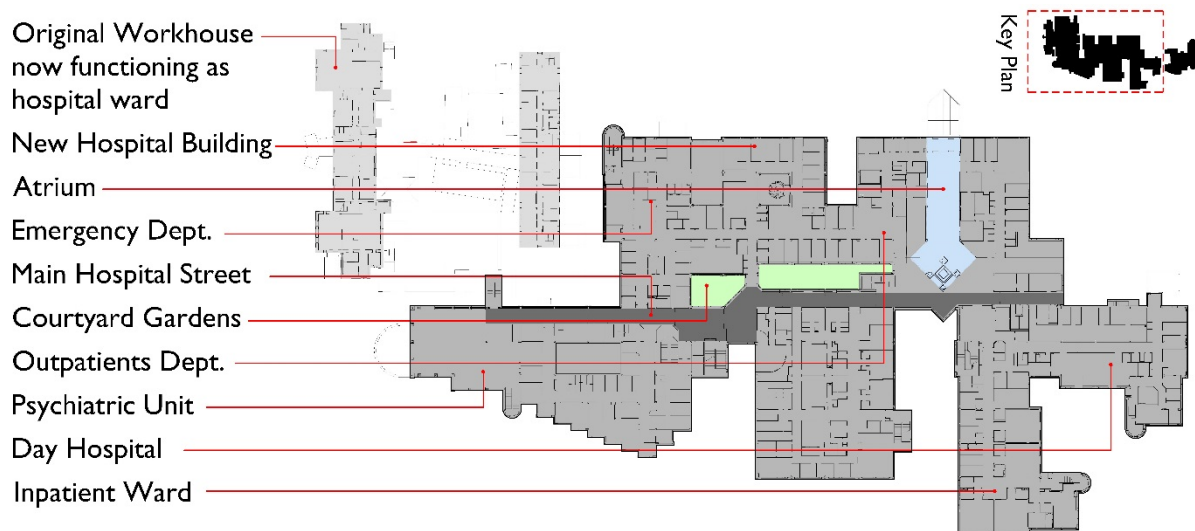




**Figure 7.22:** Hospital street (left) and services (right).

### 7.5.1.4 Key Internal and External Spaces

Naas Hospital contains a range of departments and units such as the ED, OPD, the Age-Related Day Hospital and the Psychiatric Unit. In addition to these sections of the hospital there is a number of inpatient wards composed of both specialised wards such as the Imaal Ward that provides care specifically for older people, and general non-surgical wards for other patients.



**Figure 7.23:** Hospital layout with key areas identified.

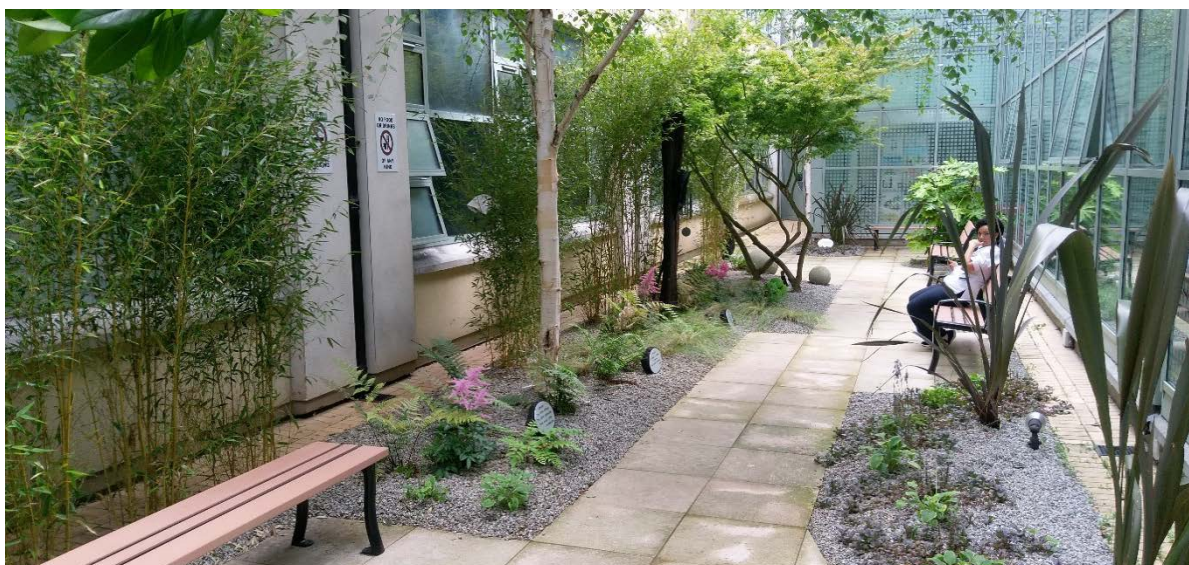


**Figure 7.24:** ED waiting area (left) and ED central staff station (right).



**Figure 7.25:** One of the OPD reception and waiting areas (left) & consulting room (right).

The OPD in Naas is quite large of the size of the hospital and it is split over level 2 and level 3, with outpatients typically access the OPD directly from the atrium space on either level. The hospital also contains an open internal courtyard garden accessible from the main hospital street, this functions as both an outdoor space and a light-well to bring natural light into the hospital street and adjacent consulting rooms.



**Figure 7.26:** Open internal courtyard garden.



The Age-Related Day Hospital is located at a right angle to the Imaal Ward and they share garden area that is directly accessed by both spaces. The Day Hospital is typically accessed through its dedicated front entrance, but can also be reached via the hospital street. The Imaal Ward is primarily accessed from the main hospital street, through the stairs and passenger lift lobby to the rear of the atrium.



**Figure 7.27:** Day Hospital Day Room (left) and courtyard garden (right).



**Figure 7.28:** Access to Imaal Ward (left) and 6-bedded room in Imaal Ward (right).

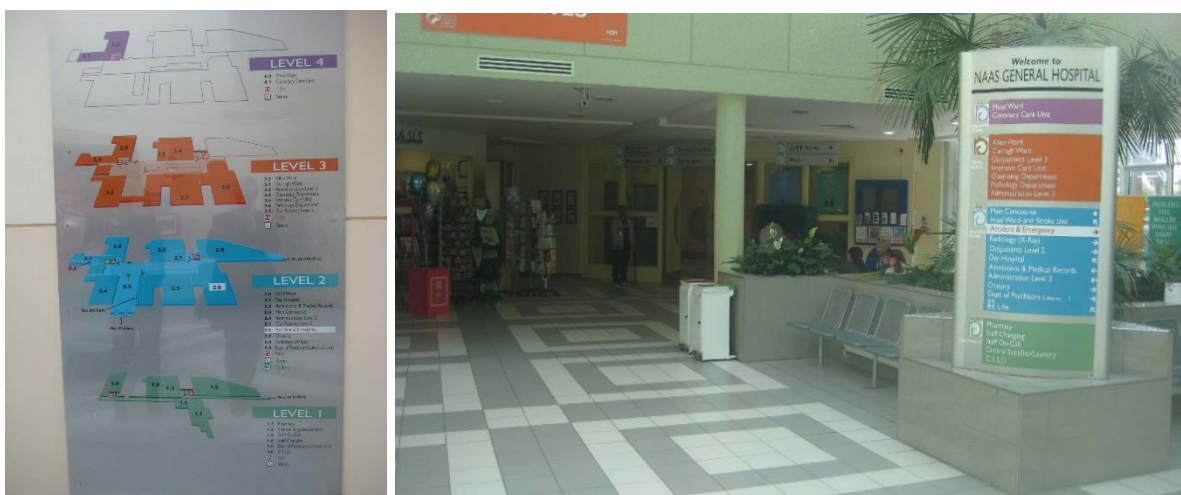
### 7.5.1.5 Building Components

Externally the key components that impact hospital users include the onsite footpaths, signage, and the availability, or lack of external seating. With regards to entering the building, components such as entrance doors are noteworthy, while internally objects such as toilet fittings, seating, internal doors, and signage, represent some of the key elements of the environment in Naas that are relevant to this research.



**Figure 7.29:** Onsite footpaths (left) entrance door to the Age-related Day Hospital (right).

Part of the wayfinding system in the hospital involves colour coded signage where the various floor levels and associated signage are given a designated colour.



**Figure 7.30:** Colour-coded wayfinding system (left) Colour-coded signage (right).

Bearing in mind the dementia friendly design issue pertaining patterns and sharply contrasting colours, some of the floor finishes in Naas may be problematic for people with dementia, or those with visual impairments (See Figure 7.30, right).

On the other hand, the hospital has implemented some internal dementia friendly modifications in the Day Hospital aimed at improving orientation and wayfinding for older people using the service. These improvements include room signage and colour contrasting door frames to help identify and differentiate key areas within the unit.





**Figure 7.31:** Signage in Day Hospital (left) colour contrasting door frames and signage (right).

### 7.5.1.6 Overall Internal Environment

Space heating in the hospital is primarily provided through wall mounted flat panel radiators (see Figure 7.32 below) that are centrally controlled as part of the overall hospital heating system. Some staff have commented that the lack of local control coupled with solar gain from the large windows can result in overheating certain locations. Ventilation to the public areas, circulation spaces, and main patient areas, such as the inpatient wards, is largely provided via openable windows.



**Figure 7.32:** South facing windows to in-patient wards.

The hospital does not have a deep floor plan and a majority of the patient areas are located close to an external wall. This configuration, along with the presence of large windows

ensure that the interior of the hospital is well lit by natural light due. However, in some south and west facing locations, staff have commented that this can produce uncomfortable heat gain and glare within certain patient rooms.

From observations and engagement with hospital users it appears that the hospital performs well in terms of ventilation. With regard to acoustics, noise transmission between consulting rooms and noise from TVs in some shared patient rooms, can be an issue, while very busy areas such as the ED are subject to noise during peak operation times. Notwithstanding these issues, it appears that the hospital typically operates at a comfortable noise level on a day-to-day basis.





**Peamount ARRU  
Co. Dublin**



## 7.6 Peamount, Age-Related Rehabilitation Unit

Peamount Healthcare is a voluntary and independent organisation which operates in partnership with the HSE and provides a range of adult health and social care services to the community of Dublin and Mid-Leinster from their campus in Newcastle Co. Dublin.

Peamount was founded in 1912 as a TB sanatorium and sits on a large parkland campus that is composed of various detached buildings housing a range of services. The Age-Related Rehabilitation Unit (ARRU), which has 25 in-patient beds, is located to the east of the site and is directly attached to the Respiratory Rehabilitation Unit.

The following sections describe the key spatial and physical features of the ARRU, its campus, and adjacent public spaces. To frame this site investigation within the context of this study, we first outline the key movement patterns of older patients and visitors within the hospital (See Figure 7.33 below). Following this, Sections 7.6.1.1 to 7.6.1.6 briefly describe the built environment across the key spatial scales, firstly, stepping back out to the scale of location approach and entry, then moving back in along the spatial scales, finishing with components and internal environment.

### 7.6.1 Main Hospital Areas and Key Movement Patterns of Older Patients

The ARRU sits within the larger Peamount campus and patients, visitors and staff must move through the main site to reach the unit. In addition, patients and visitors will use other parts of the campus, including walkways and paths that extend through the parkland setting of the campus. However, for the purpose of this study, the main areas that will be examined include the ARRU building itself, adjacent associated treatment rooms, contiguous external spaces, and the main carpark and entrance route from the overall campus. In addition to highlighting these key areas, Figure 7.33 also discusses how patients move through and interact with these spaces.

Drawing Key

- Main Vehicular Movement - - -
- Main Pedestrian Movement —
- Key Spaces within Hospital ●
- Areas examined as part of Current Research ( )
- Main starting point for patient A
- Key Area where the will spend most time A

## Peamount Campus - Approach & site circulation

All patients arrive from outside the campus, typically from a hospital such as Tallaght or Naas, where they will often be recovering from surgery or some form of acute illness. They will be brought through the main campus entrance and proceed to the front door of the unit. This occurs through by various modes of transport including:

- Ambulance
- Hospital Transport

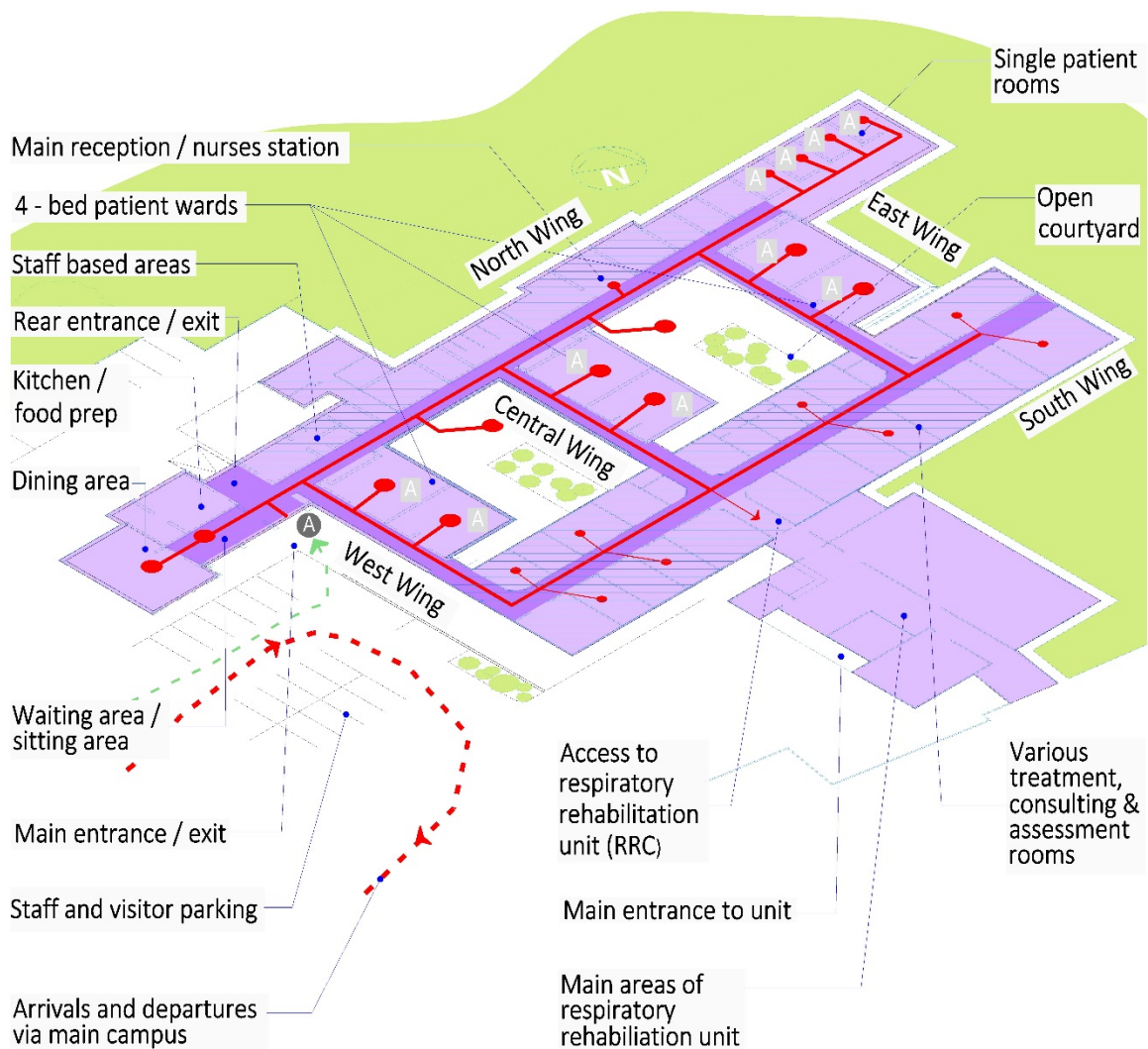


Figure 7.33: Key hospital spaces

## Hospital Interior - Key User Movement

### A – All patients (rehab in-patients)

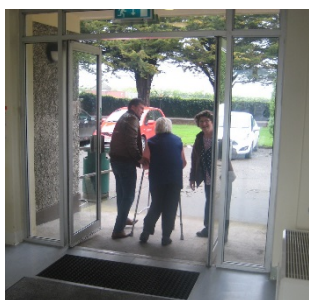
Patients entering the ARRU are often arriving following surgery or acute illness and therefore may not be independently mobile. Typically, they will be escorted by a staff member to their room in a wheelchair. While in the unit they are encouraged to mobilise using the corridors in each wing of the unit which are connected and form continuous walkways with the building. They can also travel out of the unit to the surrounding campus



#### Patient movement: common areas

The dining area- for patients who are well enough, they make their way from their rooms to the dining area where main meals are served during the day.

Sitting Area- patients can also walk to the small sitting area that is provided inside the front entrance, and to the west end of the north wing, this space forms part of the route to the dining area.



Open space - two courtyards provide sheltered open space for the patients. These spaces are accessed from the main corridor or directly from the 4-bed patient wards.

Therapeutic and treatment rooms- the south wing of the building contains most of the therapeutic and treatment rooms used for patient rehabilitation.

#### Patient movement: inpatient rooms

Three shared 4-bedded rooms- these shared rooms are located in the east, central and west wings of the unit. Patients who are well enough can leave their room and walk to other parts of the unit, or take a walk outside with an accompanying person, if required.

Four single-bed rooms- these rooms are located east end of the north wing and cater to private patients who desire a single room, or patients who require isolation due to infection risks



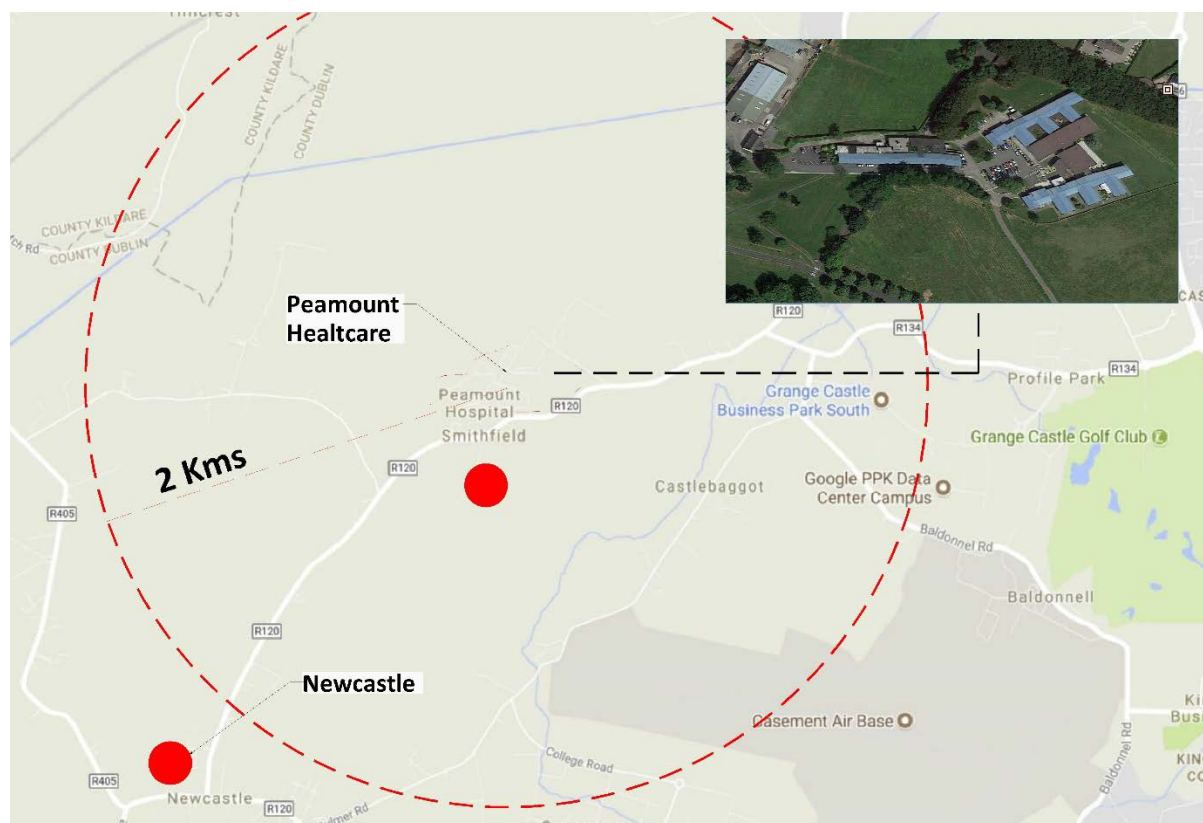
### B - Accompanying Persons

Given the fact that all patients are inpatients, and that patient stays tend to be long-term, the role of accompanying persons is different than a general acute hospital. However, the patient movement outlined in A also largely describes the movement of a visitor when they are visiting or assisting a patient.





### 7.6.1.1 Site Location, Approach and Entry



**Figure 7.34:** Hospital location

Peamount Healthcare is located just over 2km north-east of the village of Newcastle in south-west County Dublin. The campus is surrounded by farmland and is accessed via the R120, which connects Newcastle and Baldonnell.

### 7.6.1.2 Site Layout and Onsite Circulation

Peamount consists of a large parkland campus with buildings dispersed throughout the site. The ARRU shares a building with the Respiratory Rehabilitation Unit, located towards the eastern boundary, the building is accessed by vehicle and pedestrian routes through the main campus.



**Figure 7.35:** Pedestrian route through campus (left) and public carpark (right).

### 7.6.1.3 Overall building entry, internal circulation and public common areas

The ARRU is entered from the west through a set of automatic double doors, this entrance opens directly onto the primary circulation spine that forms the north wing of the unit. Upon entry, the sitting area and dining area are to the west, while the rest of the unit is laid out along this circulation spine, terminated by the single bed inpatient rooms to the east. Three secondary routes open off this spine providing access to the shared inpatient rooms, various treatment rooms, and a connection to the Respiratory Rehabilitation Unit.



**Figure 7.36:** Parking facilities (left), and main entrance to the ARRU (right).



**Figure 7.37:** Main circulation spine (left) and secondary routes off main circulation spine (right).

### 7.6.1.4 Key Internal and External Spaces

The key spaces within the unit include sitting area, dining room, nurses station, and single bed rooms in the north wing, single; shared inpatient rooms in the west, central and east wings, and treatment rooms along the south wing.

The shared inpatient rooms contain four beds, many with direct access to an outdoor courtyard. These rooms do not include ensuite bathrooms, but are instead served by shared bathrooms located along the corridor from the rooms.





**Figure 7.38:** 4-bed shared inpatient room

The unit contains two open internal courtyards that are accessed from the main circulation spine running along the north wing, and also directly from the shared rooms in the west and central wing. The courtyards contain some seating and planted areas, but according to staff they not regularly frequented by the patients.



**Figure 7.39:** Internal courtyard with eating and planted areas

### 7.6.1.5 Building Components

Considering the manner in which patients arrive, and the fact that many will experience limited mobility while attending the ARRU, they do not interact directly with the external environment to any significant degree. Notwithstanding this, the main external components that impact on patients include footpaths and patio areas adjacent to the unit and associated external seating. When entering the building the main doors are automatic but the doors to the rear entrance are standard hinged doors. I



**Figure 7.40:** Electric doors, main entrance (left) rear doors (standard hinge) (right).

Throughout the unit a number of key components such as seating, beds, and bathroom fittings are noteworthy due their impact on everyday patient access and usability. Figure 7.40 illustrates sharply contrasting blocks of colour on the floor, which may be perceived as a step or a hole. On the other hand, Figure 7.41 below shows a lack of colour contrast between the fittings and the background wall that could potentially make it hard for person with dementia to see or identify these fittings.



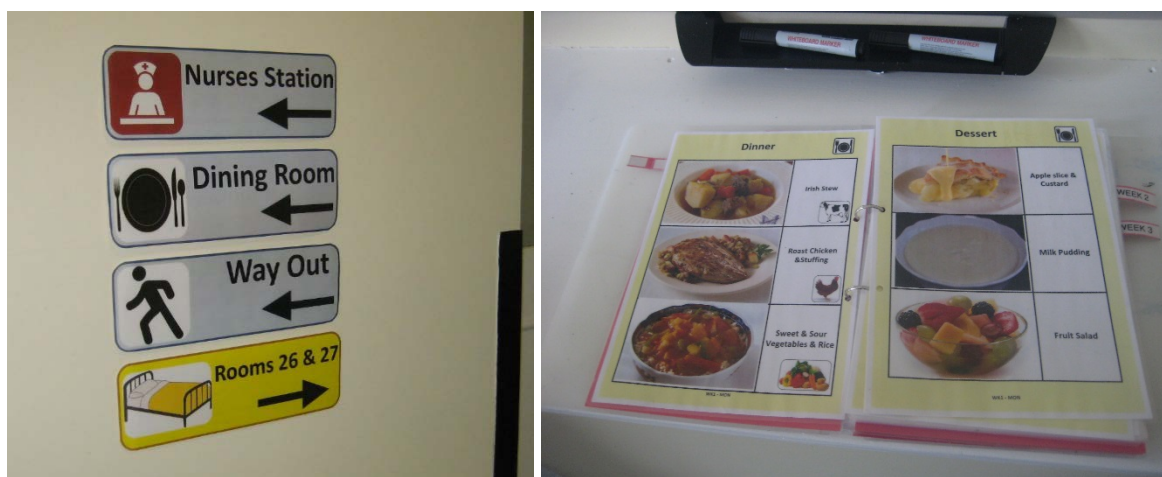
**Figure 7.41:** Common area off entrance (left), toilet, lack of colour contrast (right).



To improve wayfinding and orientation within the unit, the staff have implemented some changes including wayfinding signage, colour coding, the use of symbols, and room signage. Visual menus are used in the dining room to provide additional visual information to patients to help them understand what food is available.



**Figure 7.42:** Wayfinding signage with colour and symbol (left) colour-coding on doorway into ward (right).



**Figure 7.43:** Wayfinding signage (left) menu with visual information regarding food options (right).

### 7.6.1.6 Overall Internal Environment

Space heating in the hospital is primarily provided through wall mounted flat panel radiators (see Figure 7.44 below) distributed throughout the building. Ventilation to the circulation spaces, and main patient areas, such as the inpatient wards, is largely provided via openable windows. From observation and engagement with hospital users it appears that the unit performs well in terms of ventilation



**Figure 7.44:** Opening windows and flat panel radiators in-patient wards.

As a result of the narrow plan configuration of the unit and presence of internal open courtyards, the interior of the hospital is well lit by natural light. Regarding acoustics, the unit appears to operate at a comfortable noise level on a day-to-day basis. However, discussions with staff highlighted the issue noise from call bells that was deemed troublesome to both staff and patients.

## 7.6.2 Conclusion

Tallaght Hospital sits on a 12-hectare campus, has a floor area in excess of 120,000m<sup>2</sup> spread over four floors, contains over 500 beds and approximately 3000 staff, and provides child-health, adult, psychiatric and age-related healthcare on one site. The onsite analysis demonstrates the large scale and complex nature of Tallaght hospital and helps to illustrate the multiple spatial scales and building elements that comprise a large acute hospital.

In a similar way, but on a smaller scale, Naas with a campus of 5.25 hectares campus, and an overall floor area in excess of 28,000m<sup>2</sup> distributed over four floors, this hospital contains 243 beds, and provides an emergency department, outpatients department, an age-related day hospital, a psychiatric unit, and other healthcare facilities. Following a series of major developments starting in the late 1980s, Naas is currently composed of a series of interconnected buildings, located at the centre of the campus. The on-site analysis reinforces that, despite the smaller scale, the complexity of the hospital as reflected across the multiple spatial scales and building elements.

Finally, Peamount, while not an acute hospital, provides a range of adult health and social care services, and the ARRU, the focus of the building analysis outlined herein and stakeholder engagement process (detailed in the next section) comprises of 25 in-patient beds. Following the structure of the building analysis employed for both Tallaght and Naas, Peamount (generally), and the ARRU (specifically) are analysed and assessed across the various spatial scales and building elements, highlighting key points in relation to the hospital environment in the context of longer terms stays.

The results from the onsite analysis describe the physical hospital environment in a detailed manner and provide a context and basis for the stakeholder engagement and subsequent thematic analysis that is discussed in the next section.



## 7.7 Stakeholder Engagement: Thematic Analysis

### 7.7.1. Introduction

A thematic analysis is a research methodology is used to draw out key findings from stakeholder feedback regarding a topic, and then the feedback is organised into clear themes. This is often an iterative process where new data is collected and analysed throughout a number of cycles. For this research project, the thematic analysis methodology is informed by Chapman et al (2015) and is structured around a three-phase process, namely: 1) data collection (including stakeholder mapping); 2) data analysis, and 3) a data synthesis phase where various findings are brought together and discussed as themes. The findings presented are based on in-depth stakeholder engagement using questionnaires, and structured and semi-structured interviews with patients, accompanying persons, and staff.

### 7.7.2 Thematic Analysis Methodology

The thematic analysis methodology adopted for this research is outlined below.

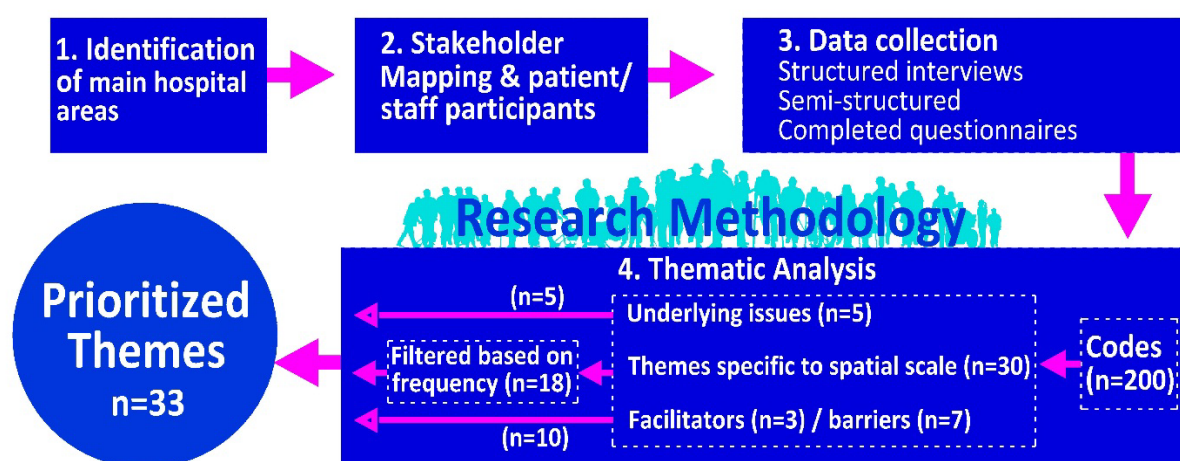


Figure 7.45: Overview of the research methodology

#### 7.7.2.1 Data Collection

##### A. Case Study Sites

The Building Analysis (Sections 7.1-7.6) provides a detailed analysis regarding the three case study sites which form the core of the stakeholder engagement, data collection, and thematic analysis, namely: Tallaght Hospital, Naas General Hospital, and Peamount. For the sake of consistency, where the built environment is mentioned in general terms, it will be referred to as the hospital environment, and should be taken to refer to all sites; where an issue is specific to a case study site, this will be made clear with reference to the specific site.

## B. Stakeholder identification and selection

One of the primary aims of this research was to examine patient experience across the full hospital environment, i.e. from the wider scale of approaching the campus, down to smallest scale of furniture or lighting. To enable this multi-scale analysis, a spatial framework was employed that included: (1) Site location; (2) Campus Approach and Entry; (3) Onsite circulation; (4) Building Entry and Internal Circulation; (5) Main Internal Spaces; (6) Building Components; and finally, (7) Internal Environment.

Due to time and resource limitations, and the size and complexity of the case study hospital environments selected for the research, it was important to choose the main areas within the above spatial scales, that are frequented by older patients and people with dementia, as a focus for this research. To identify these areas, the research team consulted with patient-facing staff and management, examined architectural plans, conducted staff guided and independent hospital walk-throughs, and carried out onsite observation sessions. These exercises allowed the research team to select several key areas including: the public and common patient areas (i.e. shops, cafes, day rooms, outdoor spaces) (all three); the OPD and the DH (Tallaght and Naas); the Williams Stokes Unit (Tallaght Hospital); the AMU and AMAU (Tallaght Hospital); the ED (Tallaght and Naas); Dining room (Peamount); and, representative inpatient wards (all three).

## C. Stakeholder Mapping: Identification and Selection of Relevant Patients and Hospital Staff

With these areas in mind, the participants selected for this research fell into one of the following stakeholder groups (SG): (a) patients; (b) accompanying persons (AP); and, (c) hospital staff. Table 7.1 outlines the selection criteria for research participants, and the aims of data collection methods.

**Table 7.1:** Stakeholder Selection criteria

SG	Selection Criteria
Patients and AP	<ul style="list-style-type: none"> <li>• Older persons who are an inpatient/outpatient/visitor to the hospital.</li> <li>• Where a person selected to participate in a structured interview or fill out a questionnaire had received a diagnosis of dementia, participation was based on their own comfort level with respect to their diagnosis; guidance from hospital staff was sought to confirm suitability for study.</li> </ul>

	<ul style="list-style-type: none"> <li>• AP is a family member/friend/carer/trusted figure, and who accompanies the older person with memory problems or dementia, in a carer capacity (no restriction on age, gender).</li> <li>• Participant, whether this is a patient or an AP, is able to engage in interviews or complete a questionnaire. In the instance of the older person, they are able to do so alone, or in the company of their carer or staff member.</li> <li>• Ability of participant (patient or an AP) to understand the questions and objectives of the research.</li> </ul>
Hospital Staff	<ul style="list-style-type: none"> <li>• Staff a range of medical, clinical, allied health professionals, facility management and administrative staff across the selected key areas of the hospital. The key selection criteria include: <ul style="list-style-type: none"> <li>• Working in the key parts of the hospital identified for this study.</li> <li>• Working with older patients within the hospital on a daily basis.</li> <li>• Have specific expertise in geriatric medicine or as specialised training in the care of the elderly.</li> </ul> </li> </ul>

#### D. Data Collection

Using these criteria, patients and APs, and a list of staff members were identified within the key areas of the hospital across all three sites. With the assistance of the hospital staff in each of the three sites, patients and staff were provided with information about the project and invited to take part through questionnaires, and, structured and semi-structured interviews (see Appendix B). For each of the three sites, Table 7.2 provides information on the stakeholder groups, area of the hospital the stakeholders originated from, and the data collection method(s) employed across these groups.

**Table 7.2: Stakeholder groups, hospital areas, and data collection method**

Stakeholder Group	Area of Hospital (Sample Size n in brackets)						Data Collection Method (n=sample size)		
	OPD	DH	AMU	ED	Wards	Other	Q	SI	SSI
	Tallaght								
Patients (including Persons with Dementia) & APs	X n=57	X n=17	X n=10		X n=23		n=95	n=12	
Staff (Medical, Administrative)	X n=2	X n=1	X n=1	X n=1	X n=10	X n=13			n=28
	Naas								
	OPD	DH	AMU	ED	Wards	Others	Q	SI	SSI

Patients (including Persons with Dementia) & APs	X	X			X		n=34	n=5		
Staff (Medical, Administrative)	n=0	n=5	n/a	n=1	n=3	n=3			n=12	
	Peamount									
	OPD	DH	AMU	ED	Wards	Others	Q	SI	SSI	
Patients (including Persons with Dementia) & APs	n/a	n/a	n/a	n/a	n=9	n/a	n=9			
Staff (Medical, Administrative)	n/a	n/a	n/a	n/a	n=1	n=6			n=7	

Legend: Q=Questionnaire; SI=Structured Interview; SSI=Semi-Structured Interview

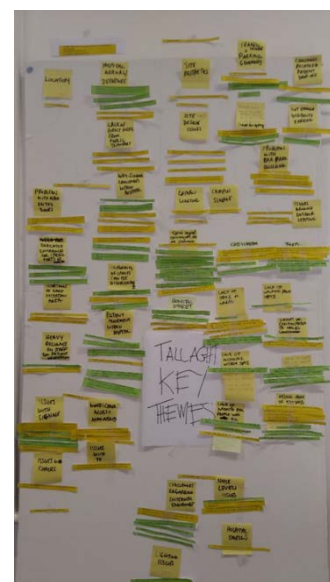
Using the spatial scale framework, a questionnaire was developed to understand how a person with dementia, their families or carers experience the physical hospital environment. With regards to stakeholder engagement with staff, two interview templates were developed to conduct staff interviews, one for patient-facing staff in the selected areas of the hospital, and a second interview template for administrative level staff. These interviews were conducted in-person, via email, or via telephone. The interviews sought to collect information regarding staff awareness of, as well as needs and preferences with respect to the built environment; and, the identification of health and well-being related outcomes for patients and their family members and/or carers in the context of the built environment.

### E. Thematic Analysis

Data collected from each of the case study sites were reviewed and compiled into short concise statements, or codes. These codes were then grouped to generate themes, which were subsequently organised into overall groups depending on whether they related to underlying issues (Group 1), to the specific spatial scales (Group 2) within the hospital, or referred to barriers and facilitators (Group 3) that span across all spatial scales. Furthermore, comments recorded across questionnaires, semi-structured and structured interviews, were quantified in order to measure the frequency with which issues (codes) were raised.



**Figure 7.46:** Coding of Staff Interviews



**Figure 7.47:** Grouping of codes into themes.

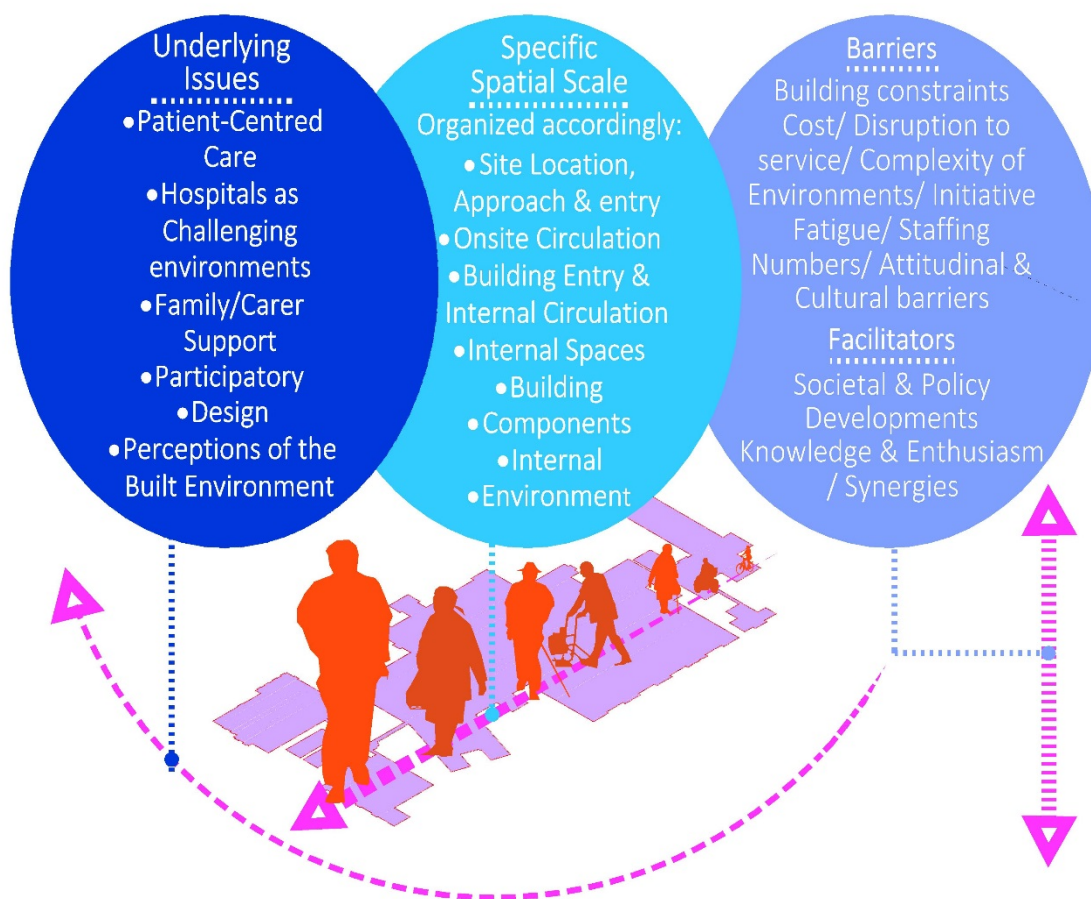
With regards to the Group 2 themes, while all spatial scales are discussed generally in the findings, an exercise was undertaken to identify a short-list of priority themes for further discussion. For the sake of expediency, themes generated based on comments from less than 10 participants are not discussed in further detail.



### 7.7.3 Findings from Thematic Analysis

As discussed in the methodology section, the hospital environment in each of the case study sites was examined in line with several key spatial scales. Across these scales, several key areas were identified that are most relevant to older patients. Please refer to the building analysis of each of the case study hospital sites, for detailed stack floor plans which show the overall built environment across the six spatial scales, and which identify the key focus areas, to illustrate the horizontal, as well as the vertical movement, and relationships between the various focus areas.

As outlined in the methodology, the main issues emerging from the thematic analysis were organised into three groups. Figure 7.48 below illustrates these groups, and these are discussed in detail in the following sections.



**Figure 7.48:** Key Themes emerging from Thematic Analysis

### 7.7.3.1 Group 1: Underlying Themes

#### **Patient-Care Should be at the Heart of Hospital Design**

Throughout the interviews conducted across all three building analysis case study sites, many staff members emphasised that patient-centred care and due consideration for family members or APs must be at the heart of any hospital. Carers need supports to help care for their loved one: “[r]elative confused by their loved ones becoming something else; don’t fully understand what dementia does to a person” (Staff interview). At the same time, “memory is a very personal thing it needs to always be dealt with the voice of the patient at the forefront....Some patients will have a background of depression or anxiety and this will sometimes make it complicated to figure out what is really going on. Some will have sleep disturbances or behavioural issues as a result of their dementia which may start as subtle changes and be difficult to tease out. We get patients on the entire spectrum from subjective memory complaints [not too many], MCI, where there is no functional loss, and then the patients with dementia. We also have to try and take into account the premorbid personality and dynamic with their family; the collateral from family and patient is regularly very conflicting and the truth will lie somewhere in between” (Staff Interview).

Across all three sites, it was acknowledged that there is a need for more staff, and staff that are trained to the proper level regarding care for the older person. Furthermore, “the relationship between the staff and the patient is paramount. Staff must have empathy for the older person; the environment comes second to that” (Staff interview).

#### **Hospital Environments are Challenging for People with Dementia**

Feedback from patients and staff across all three building analysis case study sites revealed a familiar aspect in relation to hospitals: they are busy and chaotic spaces that are especially difficult for a person with dementia due to the constant movement, activity and clinical nature of the setting – “[w]hole hospital routine can be very off-putting if you have dementia. Consultants doing rounds – power influence is strong. Patients then feel vulnerable” (Staff Interview). Sensory overload such as sound, the lack of familiarity, and disorientation and difficulties in wayfinding due to the large-scale, complex and often visually monotonous nature of the hospital contribute to the challenging nature of these environments, particularly for people with dementia.

### **Challenges Relating to Patient Movement for People with Dementia**

To compound the issues described above, feedback from staff across all sites highlight that pressure on staff, space and resources, as well as issues such as infection control often mean that patients are frequently moved from one part of hospital to another, depending on needs and health acuity. Movement of patients represents challenges for people with dementia due to changes in environment and staff, leading to disorientation and confusion. For example, ‘when you move a patient, this is when they at most at risk; oxygen disconnected, disorientating...can be moved from cold to warm (i.e. change in thermal environments can lead to patient discomfort);...lastly, when it comes to patient movement, while there will always be someone accompanying the patient, it is common for one person to take the patient to one part of the hospital to another, and then, for a different person to bring him or her back, and this, for a patient, can be very upsetting (Staff Interview).

### **The Importance of Family/Carer/APs Support**

Stakeholder feedback emphasised the important role of an AP to act as a familiar and trusted carer within the hospital. It has emerged from the stakeholder engagement that the AP, particularly a partner or sibling, may also be an older person with age-related impairments. The physical environment should be designed, where appropriate and feasible, to provide space and support for an AP to remain by the side of the person with dementia throughout their admission and journey. On this latter point, one staff interview noted, ‘with respect to the ED, we need visitor (i.e. AP) in the acute phase (when there is worry because they don’t know what is wrong); so in ED, we need space for a relative or two...space that encourages relatives to be part of care’ (Staff Interview).

### **Challenges Around Participatory Design**

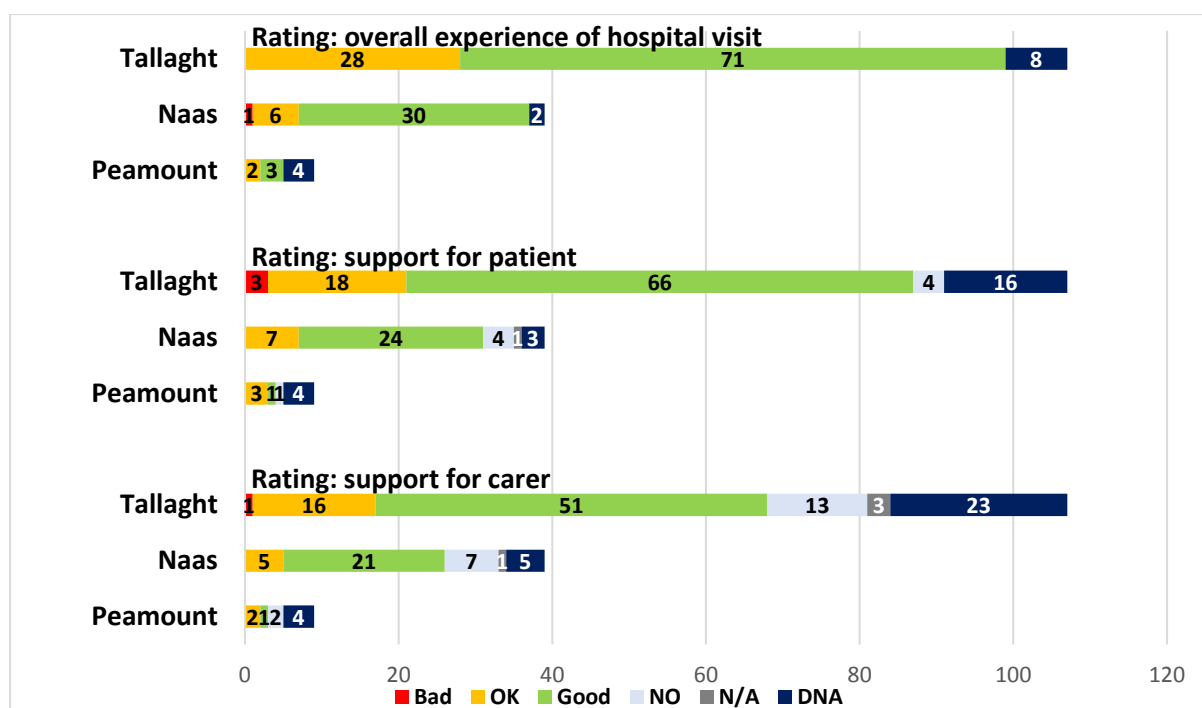
The stakeholder engagement process has illustrated that there are many challenges around participatory design processes and designing for people with dementia. Firstly, some people with dementia may have problems understanding and communicating their opinion regarding some of the complex issues relating to design and the influence or role of the built environment. Secondly, it is often the case that family members or APs will speak on behalf of the person with dementia and therefore it can be difficult to elicit direct feedback from the individual themselves. Effective participatory design must consider the relationship dynamic and the extent to which it supports and/or hinders communication with person

with dementia; in turn, this will contribute to the promotion of a more meaningful engagement with all persons impacted and affected by dementia.

### **Perception of the Built Environment**

When asked to rate their overall impressions of their hospital visits, stakeholders in each of the built analysis case study sites were generally positive. Specifically:

- Tallaght Hospital: 93% of stakeholders rated their visit to the hospital as Good, or OK; no stakeholders provided a rating of Bad in relation to this question (although 3 stakeholders rated their impression of the hospital's support for the patient as bad, while one stakeholder rated the hospital's support for the carer as bad).
- Naas Hospital: 92% of stakeholders rated their visit to the hospital as Good or OK, while one stakeholder rated their overall experience as 'Bad'. In relation to rating support for patients and support for carers, the stakeholder ratings dropped slightly, with 79% of the responses reflecting ratings of 'Good' or 'OK' for the former, and 67% of the responses reflecting ratings of 'Good' or 'OK' for the latter.
- Peamount: 56% of stakeholders provided a rating of 'Good' or 'OK' with respect to their overall experience of the Age-Related Rehabilitation Unit, with the remaining 44% providing no rating for this question (DNA= Did Not Answer). Ratings related to the environment's support of patients and carers came in at 44% (Good and OK) and 33% (Good and OK) respectively.



**Figure 7.49:** Overall views on the hospital experience (Tallaght, n=107; Naas, n=39; Peamount, n=9).

The analysis of the data revealed that while patients and their APs rated certain elements of their visits to the hospital poorly (as outlined in Section 7.7.3.2), when asked about their overall impressions, they went out of their way to share their opinions regarding the quality of care received, and the efficiency and helpfulness of the staff in delivering that care. The ratings across this section of the questionnaire suggest a low expectation of the physical hospital environment and/or lack of awareness of the built environment among the public. In other words, based on feedback received by stakeholders, their impressions (across all three building analysis case study sites) regarding the level and quality of care received while in hospital would appear to have an affect with respect to how they perceive their overall experience of the built environment, irrespective of any issues and concerns raised in relation to specific elements of the built environment which they may have found challenging or confusing during their visit(s).

On the other hand, feedback from the staff interviews revealed that there are high levels of awareness of the built environment from staff, in each of the case study sites, and this should be exploited where possible as it relates to designing dementia-friendly hospital environments.



**7.7.3.2 Group 2: Themes Specific to Spatial Scale**

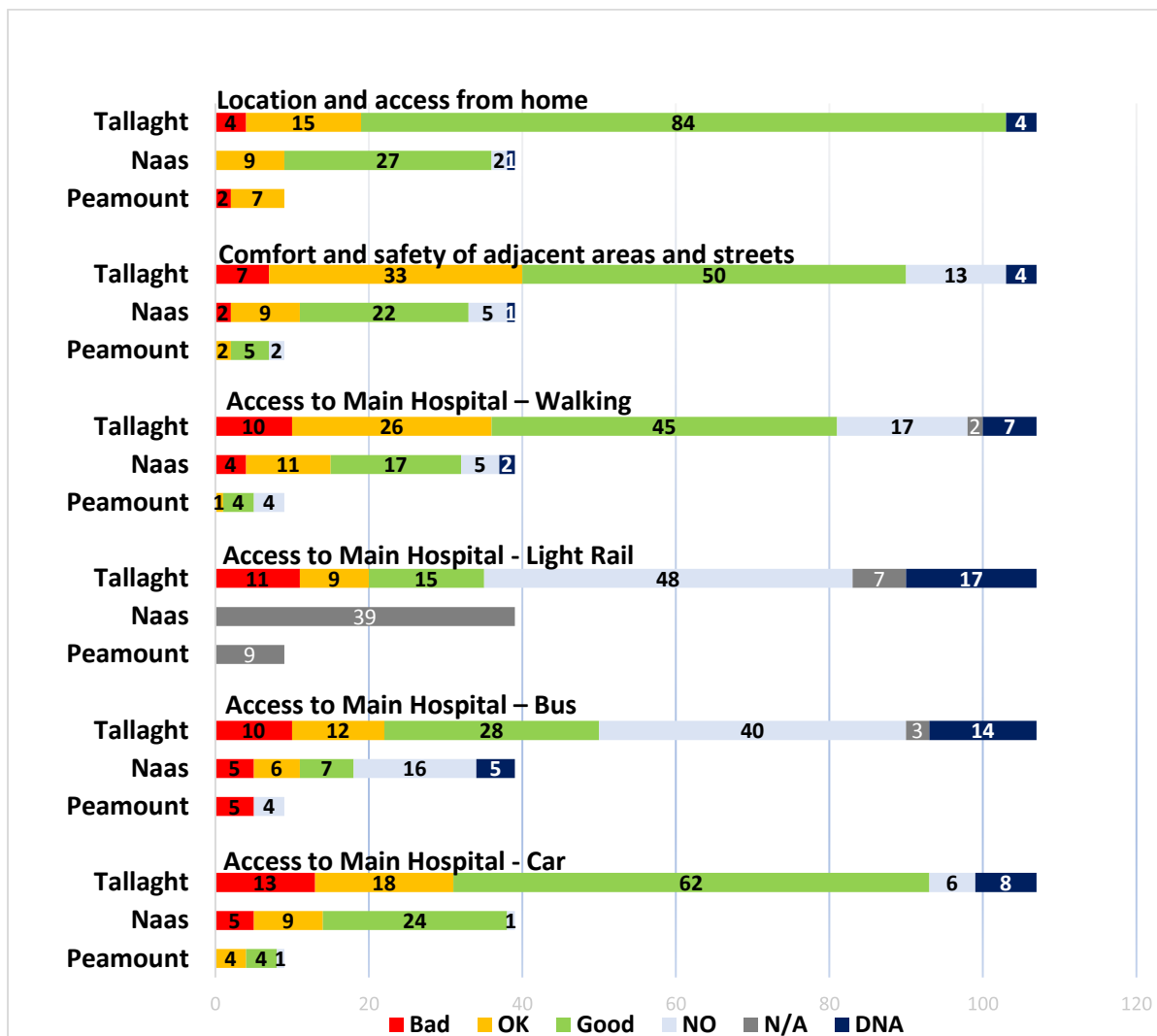
Table 7.3: Specific Spatial Scales - Shortlist Priority Themes in Green		Frequency					
		Tallaght		Naas		Peamount	
		P/C	S	P/C	S	P/C	S
Site Location, Approach & entry	Stakeholders rated location and access to the hospital from home, as well as comfort and safety of adjacent areas and streets favourably.	1					
	Issues relating to Hospital Arrival and Departure: With regards to access by car, it should be noted that a number of stakeholders raised concerns in relation to parking facilities, availability of disability parking, set-down areas, and overall campus traffic. These are discussed under priority themes related to onsite circulation.	3					
	<b>Lack of Direct Access from Public Transport</b>	10		4			
Onsite Circulation	Site Aesthetics: Responses to this element of the hospital campus were rated favourably by respondents, though one noted the industrial-looking aspect of the hospital campus as unpleasant.	2		1			
	<b>Site Layout and Site Design Issues</b>	14		7			
	<b>Traffic Volume and Parking Generally</b>	36	4	27			
	<b>Pressure on Carers and APs due to Parking Challenges</b>	16	3	2	1		
	<b>Problems with the Carpark Building (This theme is Tallaght-specific)</b>	26					
	Campus Lighting: One response that the lighting on campus was poor.	1					
	Campus Signage: Based on the findings from the Tallaght thematic analysis, one response that the signage on campus was good, while the findings from the Peamount thematic analysis captured one response describing the signage on campus as bad.	1					1
	<b>Issues Around Outdoor Seating</b>	14		1	1		
Entry & Circulation	<b>Dedicated Entrances for Specific Areas of Hospital</b>		11		6		1
	<b>Problems with Main Entry Doors</b>	22		1	1		
	<b>Importance of a Good Reception Area</b>	11		4	3		1
	<b>Wayfinding and Orientation Challenges within the Hospital</b>	37	15	16	8		7
Main Internal Spaces	Issues related to Hospital Street: This theme is Tallaght-specific. The hospital street is a very busy space, due to a high level of traffic which includes the movement of people (staff, patients, visitors) as well as hospital equipment, beds, and trucks (bins and porter services).	3	2				
	Café and Cafeteria: across both Tallaght and Naas, both were rated favourably; however, in relation to Tallaght, the location of the cafeteria from the public areas of the hospital is noted as an issue – users have to walk a long way via a very busy hospital street to access the cafeteria.	8	1	5	1		
	<b>Issues with Toilets</b>	13	3	3	4		1
	<b>Lack of Space (including lack of and/or inadequate outdoor space)</b>	11	12	2	14	1	23
	Layout/Configuration of Spaces: While the responses to this element did not reach the frequency threshold to identify it as a priority theme, an important issue worth noting here was raised by an AP in relation to the outpatients clinic in Tallaght; specifically, with respect to her mother’s experience of the built environment, the family member shared that the	1	1	3	3		

	shape of the clinic space can create panic for a person with dementia as it causes them to lose track of their accompanying person when they are getting tests done; furthermore, persons with dementia can become disoriented looking for and returning from the toilet, increasing their level of discomfort and anxiety.						
	Lack of Support for people with disabilities: Interviews highlighted the need for sit down areas, resting spots and handrails on corridors within the hospital for those with limited mobility.	1	2				
	<b>Interior Design of Space</b>	11	4	7	6		1
Building Components	Issues with Signage	22	4	10	2		3
	Wheelchair availability	13		2		1	
	Issues with TV: Overall, respondents perceived TVs in a number of ways, from being a welcome distraction and generally good, to being bland, and requesting that they be removed. Some stakeholder questionnaires stated that there were no TVs in the wards (or that there were inconsistencies across the wards, with some having TVs and others not). Interviews with staff from the emergency department in Tallaght noted that the TVs were good, as a means to pass the time while people waited to be triaged.	6		1	2		
	<b>Issues with Seating and Chairs</b>	8		11			
	Issues with Technology		1	1	2		3
	Issues with Beds						1
	Issues with Nurses' Station				1		1
	Issues with the handwashing stations: The location of the handwashing stations was raised as an issue – it was an obstacle, and created a blockage of movement for individuals moving through the main entrance (i.e. too close to the main doors). The handwashing stations are an infection control measure in the hospital; as such, their positioning aligns with hospital policy with respect to infection control.	3					
	<b>Challenges regarding the internal environment</b>	13	4	2	1		
<b>Noise Levels are an Issue</b>	10	1	1	2			
Internal Environment	Hospital Smells: Two Ps noted smells 'not perceived due to poor sense of smell'. An AP stated that '(hospitals) don't smell like they used to'.	3					1
	Lighting Issues: Generally, lighting was rated favourably across the staff interviews and stakeholder questionnaires. Specific to Tallaght, with respect to the lighting in the cafeteria, staff noted that, 'while lighting is controlled, it is sometimes necessary to turn on the lights because it is too dark [outside]. Several patients and APs noted that lighting can be poor, generally, with the waiting room in the Outpatients Clinic perceived as being dull (as a result of lighting). On the other hand, lighting was noted by patients as an issue, especially at night, as it was 'too bright', and its 'not being turned off'. Keeping the lighting turned on during the night is an issue for persons with dementia as it has an impact on their ability to distinguish different times of day, and the activities associated with day-time light (awake, active) and night-time light (sleeping).	5	1	1			2

P/C= Patient or Carer; S = Staff; AP = Accompanying Person

### Site Location, Approach and Entry

Figure 7.50 presents respondent ratings regarding the location of the case study sites, comfort and safety of adjacent areas and streets, as well as impressions relating to access to the each of the sites across various modes of transportation.



**Figure 7.50:** Stakeholder Ratings on Site Location, Approach and Entry

Favourable ratings were recorded across all elements in each of the case study sites on questions related to this spatial scale; however, further analysis points to an issue with respect to public transport, discussed below. In addition, while the ratings above are generally favourable with regards to accessing each of the hospital sites via car, there are issues related to parking facilities and availability of disability parking spaces that will be further discussed ‘Onsite Circulation – Moving Around the Hospital Grounds’.

## Priority theme: Lack of Direct Access from Public Transport

**“LUAS is a fair distance; thinking of the older person, not great for someone with mobility issues – my dad couldn’t walk to the gate”  
Accompanying Person**

Across all three building analysis case study sites, lack of direct access from public transport was raised as an issue. With respect to Peamount, there is no public transport route that links the site to the surrounding area; this is reflected in the rating provided by respondents, where more than half (56%) of respondents provided a rating of ‘Bad’ in relation to this question.

Structured interviews in the outpatients clinic in Naas General Hospital highlight a concern with public transport, as it relates to both the location of the bus stop from the entrance to the Naas hospital campus, and the degree of traffic on the road leading up to Naas Hospital. During one particular interview with family members, it was acknowledged that while it ‘would be better to take the bus (owing to difficulties with finding parking on-site), the bus stops in the middle of a busy road; for someone like my mother, it wouldn’t be safe – cars flying up and down (the road)’. These issues were reinforced by another respondent who noted that, for him, he is ‘unable to use public transport as there is too much walking...the road around the hospital is very busy’. Lastly, given stakeholder impressions that public transport is not a ‘feasible, (i.e. viable) option for them’ (Stakeholder Questionnaire), most patients and/or APs resort to accessing the hospital campus by car; this in turn highlights issues related to site layout and design, and , the ability of the car park to accommodate the demand for parking. These issues will be discussed in greater detail in the following section, however it is worth noting the impact of lack of access from public transport, and the particular exacerbating effect it appears to have on Naas Hospital parking facilities.

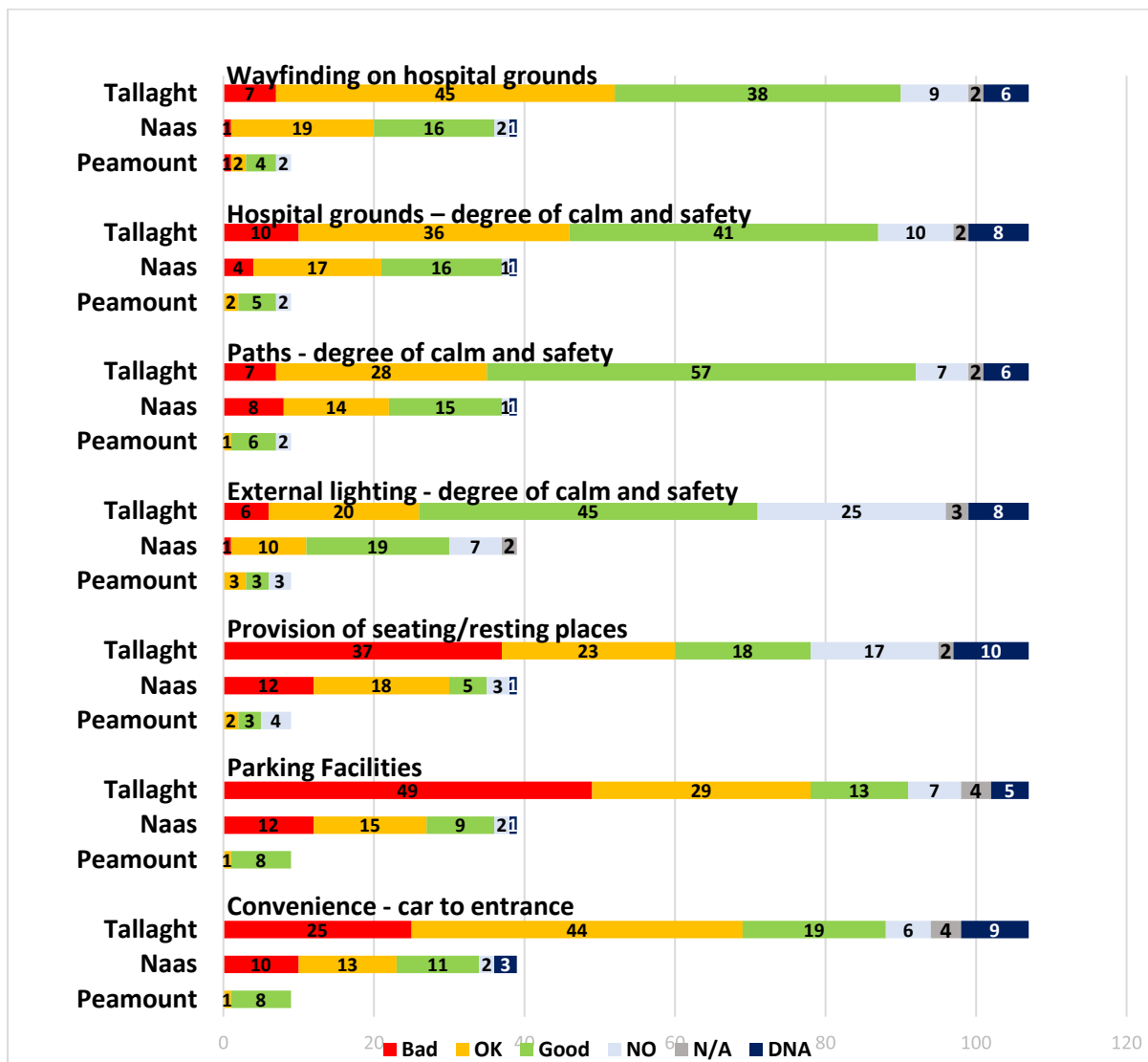
With regards to the results from the stakeholder engagement process in Tallaght Hospital, APs noted that with respect to the bus, it would be ‘better if there was a bus stop on the hospital campus’ as the location of the current bus stop is perceived as a ‘bit of a walk’, especially for an older person, a person with dementia, or a person with mobility issues (Stakeholder Interviews/Questionnaires). Unlike Naas and Peamount, Tallaght Hospital is on the LUAS red line, with a hospital stop located on the western perimeter of the hospital campus; however, analysis of the ratings related to this question highlight that only 14% of stakeholder respondents gave a rating of ‘Good’ regarding travelling to the hospital via

LUAS, while two thirds of respondents (67%) selected 'No Opinion', 'Not Applicable', or 'Did Not Answer'; further analysis of the written responses from the questionnaires note that excessive distance from the LUAS stop to the main entrance of the hospital was cited as a reason for why APs would not be inclined to use the LUAS as a means of getting to the hospital. It should be noted that while there is a gate at the LUAS stop which provides direct access to the hospital campus, it is currently not in use, meaning that patients and APs which opt to use the LUAS as their mode of transport to the hospital, must walk along and around a portion of the campus perimeter to access the hospital. For an individual with mobility issues, an older person, or a person with dementia the distance from the LUAS to the hospital entrance may prove to be a challenge, one which may contribute to patients and APs decision to opt against using public transport as a means of arriving/departing the hospital. On this point, it should be noted that an overwhelming majority of those surveyed arrive at Tallaght via car (almost three quarters of respondents noted that they use a car to travel to and from the hospital). As a result, and consistent with findings from the Naas stakeholder engagement process, the lack of direct access of public transport to the hospital grounds creates issues in relation to the parking facilities, both general, and specific to the multi-level carpark on the Tallaght Hospital campus (and this, despite the favourable rating provided by stakeholders with regards to accessing the hospital campus by car, i.e. 75% rated access by car as either 'Good' or 'OK').



### Onsite Circulation - Moving Around the Hospital Grounds

Figure 7.41 focusses on respondents’ impressions with respect to the following: wayfinding on hospital grounds; degree of calm and safety on hospital grounds, including paths and external lighting; provision of outdoor seating and resting places; parking facilities; and, convenience from car to main hospital entrance.



**Figure 5.41:** Stakeholder Ratings in relation to Moving Around Hospital Grounds. Generally, the ratings for elements related to on-site circulation received a mixed response. Priority themes emerged from the thematic analysis and these are discussed below. Based on the ratings as well as coding frequency measured during the thematic analysis, the priority themes discussed will focus on findings from the stakeholder engagement processes undertaken at both Naas and Tallaght building analysis case study sites.

### Priority Theme: Site Layout and Site Design Issues

Site layout and design appears to exacerbate the pressure placed on the AP to effectively navigate the hospital campus environment. In Naas, one AP described the campus as ‘disastrous’ (Stakeholder Questionnaire), while another noted that there could be improvements made in terms of the access to ‘drop-off and collecting of patients; the space is there’ (Stakeholder Questionnaire). Four respondents noted that the campus is not suitable for individuals with mobility issues, with one AP highlighting a difficulty with respect to pushing a wheelchair, while three stakeholders shared that the footpaths are problematic due to their not being wide enough, the volume of pedestrian traffic, their being slippery when wet, and uneven. With respect to the findings at Tallaght hospital, in addition to the campus not being suitable for people with mobility issues (3 mentions) the stakeholder engagement process identified that there is a need to incorporate more pedestrian crossings on campus, as well as improving the footpaths to accommodate the volume of pedestrian traffic. Specific to the pedestrian crossing located between the car park building and the hospital, the placement of the carpark in such close proximity to the ED has contributed to an overall negative perception by both patients and accompanying persons of the hospital grounds with regards to them being safe and calm.



**Figure 5.42 :** Photo of Access Road to Tallaght Hospital.

### **Priority Theme: Traffic Volume and Parking Generally**

**“Hard to access disabled spaces. Always full and other spaces are not wide enough” Patient**

The most frequent mode of transport used by stakeholders to and from the hospital sites is the car; specifically, 85% of stakeholders attending the Naas General Hospital arrive by car, while 73% of stakeholders attending Tallaght Hospital do so by car. Across both sites, the stakeholder engagement process identified that it can be difficult to find a parking spot during a busy day at the hospital; specific reasons for this include lack of parking spaces, and high traffic volumes (17 mentions in Tallaght, and 14 mentions in Naas). One respondent attending the age-related outpatients clinic in Tallaght stated during her interview that, to be on time for her parents’ appointment, she ‘makes a point of arriving at the hospital a half an hour early to negotiate parking on campus’ (Stakeholder Interview). With respect to Naas, one respondent noted that ‘one could be driving around for an hour looking for a space’ (Stakeholder Questionnaire), and another stated that ‘the carpark is always full, and areas not originally designed for parking are used’ (Stakeholder Questionnaire). Lastly, insufficient disability parking spots was also highlighted as a key concern in both Naas and Tallaght. Of the 67 times parking was coded as an issue in both hospital sites, 20 were related specifically to the lack of and/or inadequate levels of disability parking spaces in Tallaght and Naas.

### **Priority Theme: Problems with Carpark Building**

**“Parking expensive and inaccessible above the first floor” Accompanying Person**

This theme deals specifically with issues related to the multi-storey carpark building on the grounds of Tallaght Hospital. The parking spaces in the carpark are viewed as difficult to manoeuvre owing to their being too tight; furthermore, many patients and AP avoid parking on the upper floors, and this due to (1) the tight turning radii on the ramps between the levels; and, (2) it not being easy for an older person with mobility issues to navigate through the carpark environment when travelling down from an upper level. Lastly, one respondent noted the issue of accessibility in relation to the pedestrian crossing leading to and from the carpark facilities: ‘zebra crossing from multi-storey [carpark] to hospital is poorly designed; when wheeling patient from hospital to car, there’s an edge on path onto crossing and it toppled patient from the wheelchair’ (Stakeholder Questionnaire).



**Figure 7.43:** Multi-storey carpark in Tallaght.

### **Priority Theme: Issues related to Outdoor Seating**

Outdoor seating was rated poorly by respondents in both Naas and Tallaght. While staff in Tallaght acknowledge that ‘we probably don’t have enough lay-down spaces – a place with some chairs, for a person to stop and re-group’, with regards to external seating, the ‘issue is smoking; nice to have seating but practically, doesn’t work’ (Staff Interview). In Naas, stakeholder interviews and questionnaires highlighted the lack of outdoor seating on the hospital grounds.

### **Priority Theme: Pressure on Carers and APs due to Parking Challenges**

**“Big hospital for the catchment area. Parking is dreadful and depending what part of the hospital you park in, you need two people to drop off.” Patient**

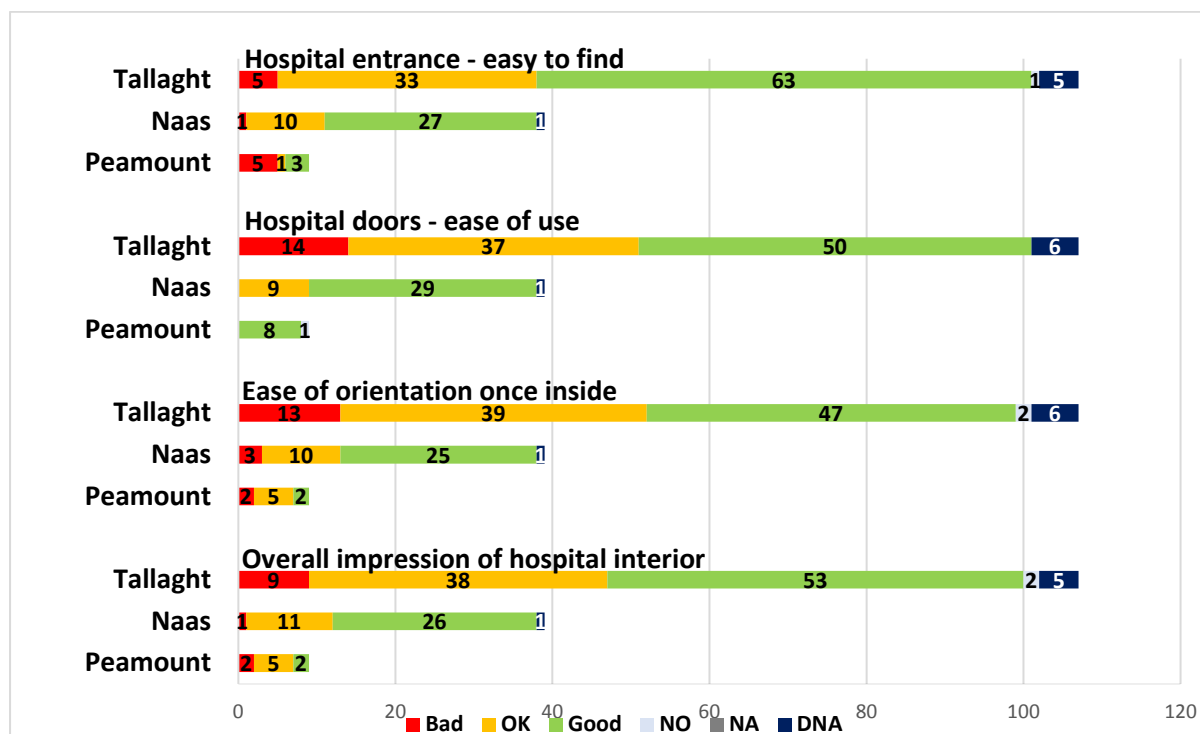
While parking challenges were noted in both Naas and Tallaght, the pressure it puts on carers and APs came out quite strongly as part of the engagement process in Tallaght Hospital. Specifically, it was noted that for those attending Tallaght hospital, one AP is not sufficient; having only one AP can mean that the patient must navigate a busy carpark, and once that is accomplished, the person is then expected to successfully negotiate a significant distance from the carpark building, including the pedestrian crossing, which has been highlighted as problematic due to its proximity to the ED. For an older person with mobility issues or a person with dementia wayfinding through a hospital campus the size of Tallaght can be a stressful experience; one respondent noted that it takes her father ‘20 mins to

walk from the carpark to the main entrance as he needs to stop and look at things' (Stakeholder Interview). Some patients have a minimum of two APs join them for their hospital visit; this reduces (1) the risk of a patient wandering off while their carer or family member is parking the car, and (2) the stress and worry for the AP who is parking, knowing that there is someone else with family member or patient.



## Building Entry and Internal Circulation

Figure 7.44 outlines respondents' impressions with respect to the following: hospital entrance; ease of use of hospital doors; orientation inside the hospital; and, overall impressions of the hospital interior.



**Figure 7.44:** Stakeholder Ratings on Building Entry and Internal Circulation.

Overall, impressions regarding building entry and circulation across all three case study sites were rated favourably, however it is worth noting the poor ratings provided by the stakeholder engagement process in Peamount with respect to the entrance being easy to find (56% gave this component of the building a rating of 'Bad'), and the less than favourable ratings a portion of stakeholders in each of the sites shared with respect to ease of orientation once inside. Priority themes building upon these ratings, as well as comments from patients, APs and staff, are discussed below.

### Priority Theme: Issues Related to Dedicated Entrances for Specific Areas

Specific to both the Naas and Tallaght case studies, staff highlighted that there are specific hospital entrances, depending on inpatient/outpatient status. In Tallaght, staff interviews highlighted that movement throughout the hospital will be dependent on 'appointment, therapy, and parking' (i.e. these will influence whether or not a patient will enter the hospital via the Charlie O'Toole Day Hospital entrance, the main entrance, etc). With regards to Naas Hospital, it was noted that there is confusion around dedicated entrances,

with three staff members working at the age-related Day Hospital explaining that it is not uncommon for patients to ‘confuse the Day Hospital entrance with the Day Ward entrance’ (Staff Interviews); this in turn, requires staff members to go to the Day Ward to guide patients and APs back to Day Hospital.

### **Priority Theme: Problems with Main Entry Doors**

This theme focusses primarily on problems relating to the ease of use of the revolving and side doors at the main entrance at Tallaght Hospital; that said, it should be noted that accessibility concerns and stiffness of doors at the age-related Day Hospital in Naas were raised by both staff and patients/APs as issues. With respect to the stakeholder engagement process in Tallaght, key aspects leading respondents to give a less than favourable rating to the entrance doors include concerns with the weight and stiffness of the side doors, and high levels of apprehension vis-à-vis the automatic rotating doors, leading most individuals to avoiding them all together, opting instead for the side doors. One respondent stated that with respect to accessibility neither door option is suitable; specifically, it is ‘impossible for wheelchairs if you have to use the side doors. Can’t hold them (the doors) and push the wheelchair, and yet, you can’t use the rotating door either. Very awkward’ (Stakeholder Questionnaire). The issue concerning the degree to which the automatic revolving door is both easily recognized and identified as being a door can be inferred from the following comment from an AP who stated that ‘Dad couldn’t find the door, but mum could’ (Stakeholder Interview).



**Figure 7.45:** Image of main doors in Tallaght Hospital.

### **Priority Theme: Importance of a Good Reception Area**

A good reception area will ideally provide patients and accompanying persons with a good starting point from which to navigate the internal hospital environment. Comments gathered from the stakeholder interviews across all three building analysis case study sites reflect a range of views with regards to the reception area in the hospital, with some stakeholders viewing the reception as helpful, and others, particularly in Tallaght, foregoing it altogether. With respect to the stakeholder engagement process in Peamount, staff members noted that the location of the reception area is problematic: '(Individuals) go down to reception hall, issue because the reception isn't at the entrance. No sign to point to reception; often see carers asking where they can go' (Staff Interview). In Naas, one respondent noted that 'main entrance and reception is too much on one side; where they have the seating area (in the centre of the foyer) is where the reception should be' (Stakeholder Questionnaire).

### **Priority Theme: Wayfinding and Orientation Challenges within the Hospital**

As previously noted, hospitals are complex and challenging environments. Across all three sites, the stakeholder engagement process highlights patients and APs impressions regarding difficulties associated with navigating the environment, including due to having to move through too many corridors, especially on a first visit (i.e. scattered, big, and confusing). Staff interviews confirm that there can be a higher demand on new patients to navigate the hospital environment; during a first visit to the age-related health outpatient clinic in Tallaght, patients and their APs are sent for multiple tests, scheduled in different areas of the hospital, usually off busy hospital street. As a result, there is a lot of pressure placed on APs and patients to successfully navigate an environment that, owing to it being their first visit, is unfamiliar to them. This in turn has a negative impact on wayfinding and orientation in relation to the hospital. With respect to the OPD clinic in Naas, interviews with patients and APs highlight that 'long corridors make it difficult to manoeuvre...difficult to navigate, you are diverted left and right, and then you have to find you way back' (Stakeholder Questionnaire); furthermore, the OPD is spread across two floors/levels and this presents particular challenges regarding wayfinding and orientation for patients, i.e. 'for us (APs) it's fine, but for my mom, not good; OPD is across two floors and they don't tell you which one to go to. Even going for bloods is difficult' (Stakeholder interview).

In both Tallaght and Naas wayfinding difficulties are not restricted to patients attending the age-related health outpatients clinics in their respective OPDs. Interviews conducted with staff across all hospital areas also noted that the location of certain tests and facilities (e.g. toilets) will lead to patient disorientation. Impressions regarding ease of orientation once inside was generally rated favourably; however, examination of the responses across interviews and questionnaires highlights that there are challenges associated with wayfinding and orientation. In Naas, one respondent noted that ‘every hospital has its own system. Entrance is fine but it’s getting through the hospital that is difficult’ (Stakeholder Questionnaire). Another respondent highlighted that ‘signage is poor; always have to ask someone if I am in the right place’ (Stakeholder Questionnaire). While signage will be further discussed in with regards to priority themes related to building components, it is important to highlight respondents’ impressions of signage with respect to being able to find their way and orientate themselves inside the hospital; patients shared that they would not be ‘able to find (their) way around by themselves, but...always have someone with me’ (Stakeholder Interview). That said, APs noted their concern regarding their ability to navigate the internal hospital environment, with one AP stating, ‘if I’m confused it’s difficult to reassure someone else’ (Stakeholder interview)

Across all three hospital building analysis case studies, the uniformity of internal hospital spaces was identified by all stakeholder groups as an issue that negatively impacts their ability to successfully navigate through the hospital environment. One staff interview in Naas described the uniformity of the environment and the impact it has on patients and staff in this manner: ‘every wall is yellow and every single person (without fail) walks the wrong way out of my room, and is disorientated leaving my room; I always walk them back to main reception’ (Staff Interview). In relation to the ward environment in Naas, staff interviews revealed that while patients will be accompanied by porters for tests, ‘it can be difficult, particularly for patients experiencing episodes of acute confusion – everything looks the same’ (Staff Interview). Similarly, staff members in Tallaght pointed out that the consistent look of corridors (across all hospital levels), coupled with poor signage or signage that is ambiguous at best, contribute to an environment that patients find disorientating. One staff member described Tallaght Hospital as follows: ‘If you picked an environment, it’s the worst environment, most areas have waiting areas, busy, noisy, not conducive, and if you look at the carer, knowing where to go, and who to ask, our signage isn’t wonderful. We don’t have an environment that is conducive where they can follow instructions. We have very generic

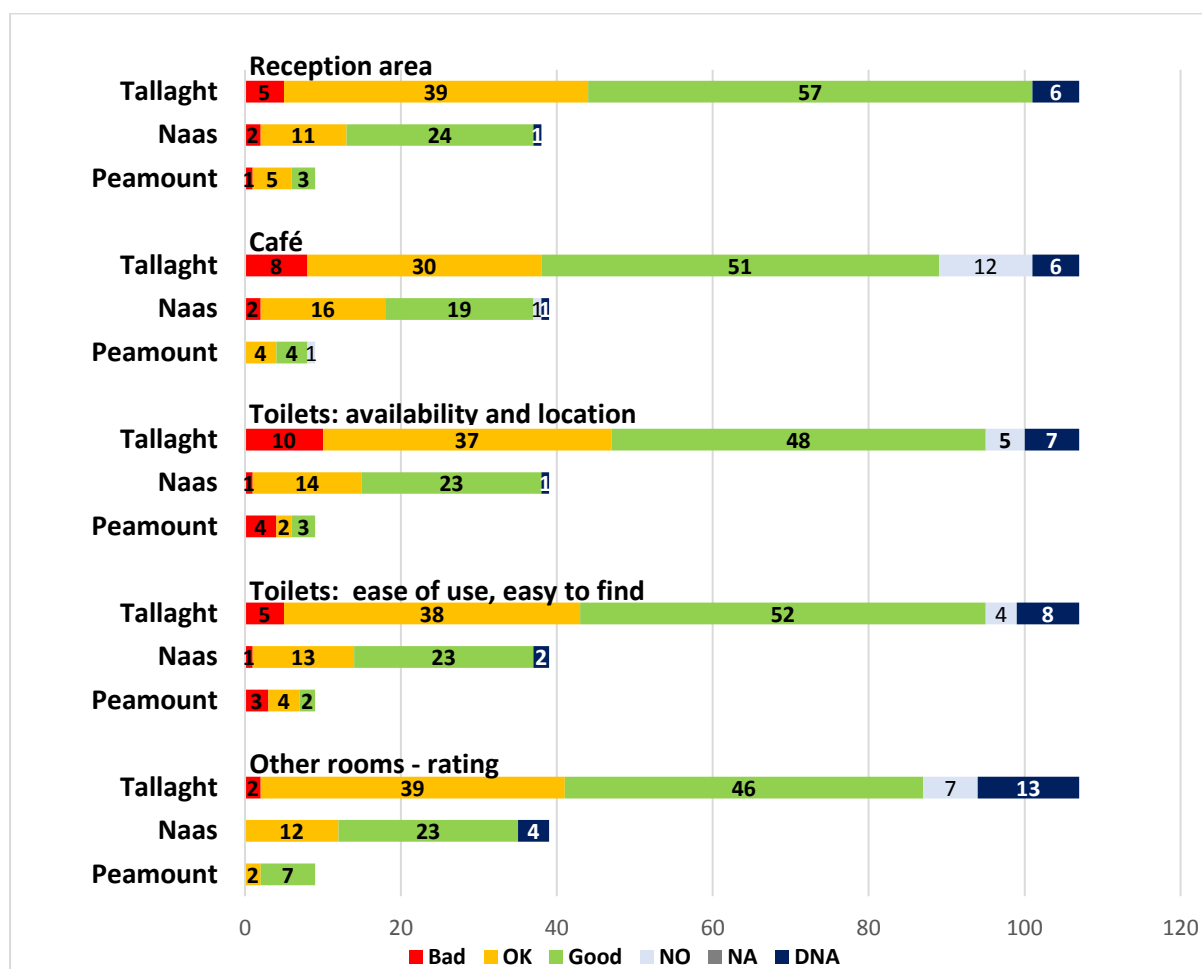
colours, everything is sterile, and the same' (Staff Interview). Lastly, a respondent who participated in the stakeholder engagement process in Tallaght described being late for an appointment due to getting lost in the hospital as 'unfair' (Stakeholder Interview).

In Peamount, staff interviews acknowledge that 'while colour-coding on the blocks (i.e. ARRU wing) has made a difference... it's a busy space/place. I do see relatives stop people to ask for information. A lot of time is spent directing people' (Staff Interview). On this point, it is interesting to note the frequency with which patients and APs across all three building analysis case study sites stated that they will ask someone for directions (35 times). In many cases, patients and APs will go straight to staff (i.e. will not use the signage and other way-finding aids) for assistance in navigating the hospital environment.



## Main Internal Spaces

Figure 7.46 highlights stakeholder perspectives regarding the main spaces in the hospital.



**Figure 7.46:** Stakeholder ratings on main internal spaces.

Overall, the main spaces in the hospital were rated favourably by patients and their carers.

Priority themes are discussed below.

### Priority Theme: Issues with Toilets

Despite the favourable rating captured in relation to toilets, stakeholder responses highlighted a number of problems across all three building analysis case study sites in relation to toilets, including: not being enough toilets (in terms of numbers); too small; not accessible; unclean, and having a smell. While there were no specific comments raised by respondents in Peamount with regards to the toilets, stakeholder responses in Naas noted that toilets were ‘not in the right place’ (Stakeholder Questionnaire) and, with respect to accessibility two respondents shared that toilet doors can be ‘difficult to open, for a person using a frame’ (Stakeholder Questionnaire); furthermore, it can be ‘hard to bring in the frame; very awkward’ (Stakeholder Questionnaire). Respondents in Naas also noted that the

toilets don't 'stick out' enough. On this point, it is worth referring back to the building analysis of Naas, and the efforts have been made to make the toilets stand out more; furthermore, staff in the Day Hospital stated, during interviews, that 'we've made an outline of the door to make the toilets more visible and recognizable to patients (Staff Interview). That said, patient and APs regarding the toilet facilities not being obvious enough are warranted as there are inconsistencies across the hospital; staff in the Imaal ward note that toilets are not 'sign-posted well' (Staff Interview).

Specific to the Tallaght stakeholder engagement process, the key issue focussed on toilets which are accessible. For someone in a wheelchair requiring toilet facilities that are accessible, individuals must go to the OPD. In addition, staff interviews revealed that the number of wheelchair/hoist-friendly toilets needs to be addressed; the lack of these types of toilets is not ideal for patient comfort.

### **Priority Theme: Lack of Space**

**“Outpatients area is too small and tight; older people can't get up – too many wheelchairs” Accompanying Person**

The stakeholder engagement process demonstrated that lack of space in the hospital environment is a critical issue, across all three case study sites. For example, in Tallaght, respondents stated that the corridor leading to age-related outpatients clinic in OPD is too narrow, and that the space of the clinic itself is too small and tight for the volume of people attending this particular clinic. As previously noted, parking challenges in Tallaght Hospital translate to patients being accompanied to the hospital by at least two persons, and during a busy clinic, an appointment for one person could result in three people in the waiting area. Staff noted clinic ebb and flow impacts the capacity of the waiting room to cater to patients with respect to seating availability and wheelchair space.

Staff in each of the building analysis case study sites expressed concern with respect to space on the wards, for both staff and patient needs; generally, staff noted that they find that the wards are too cramped and cluttered. In Tallaght, one staff member noted that 'nurses need space (to do their work but) leave meds on table, IVs, because there's no space' (Staff Interview). Staff interviews in Naas highlighted that in the wards 'more space would be a benefit at the bedside – if three family members at each bed, it gets busy' (Staff Interviews). Lastly, in Peamount, staff interviews noted the importance of having 'multi-functional spaces,

including equipment serving a number of functions...to reduce the amount of equipment needed and make hospital spaces more flexible. Currently, there is a lack of flexibility within patient rooms to deal with the multiple needs of patients; individual patient needs will change throughout the course of their illness, and needs differ greatly from patient to patient' (Staff Interviews).

Adequate space for pacing and walking is beneficial for patients, particularly for persons with dementia; the availability of space for pacing and walking was identified as an issue, both positively and negatively, across the hospital sites. For example, owing to configuration and layout of space in the AMU in Tallaght, there is no space for pacing, and this was raised as a key concern during staff interviews. On the other hand, staff in interviews in the Naas Day Hospital pointed to the fact that the 'Day Hospital planned a circular environment' (Staff Interviews) for walking. That said, stakeholders raised the need for pacing space in the ED in Naas. Meanwhile, in Peamount, staff interviews note that where patients are mobile and cognitively sound, they may walk around the ward independently (or with family).

Access to outdoor space was raised in staff interviews, across multiple hospital areas, in each of the three sites. With respect to the AMU and OPD in Tallaght, there is currently no access to outdoor space, and while the Charlie O'Toole DH has a rather large garden area adjacent to the day room, it is not a safe space for patients because of uneven surfaces, poorly maintained furniture, and a lack of lighting. In Naas, the Day Hospital has access to an enclosed outdoor garden space which staff note is well-used when it is sunny. As noted in the Naas building analysis, the Imaal ward opens out onto the same garden space; however, staff interviews noted that owing to a garden gate not being fixed until recently, access to the garden was limited, resulting in the space being underused by patients from that particular ward. It is interesting to note that despite access to an internal garden space in close proximity to the OPD in Naas, no stakeholder questionnaires made reference to it in their comments; this raises questions regarding whether or not patients and APs are aware of this space, and whether or not they feel welcome to use it during their visit. Finally, in Peamount, staff interviews highlighted that a 'good aspect of Peamount is the access to the outdoors...the fact that there is a lot of nature is good for health; all patients are on the ground floor, so they are able to see outside' (Staff Interviews). That said, one staff interview noted that while 'we have enclosed courtyards (and) suntraps that are safe, they are not being used' (Staff Interviews).

The need to have distinct spaces to support distinct activities (i.e. sleeping vs eating) was raised by staff in each of sites. Encouraging family/APs to visit the hospital, especially during meal times was considered important, especially for people with dementia. In Tallaght and Peamount, staff noted that owing to the dining room settings (in the DH in Tallaght, and the separate dining room in Peamount), meal time is much more conducive to the promotion of good nutrition – ‘the familiarity of the space as one for eating provides the cues for people to engage in activities of daily living, as well as supporting eating as a communal activity’ (Staff Interview). Staff in the DH in Naas described the central area as a ‘very welcoming environment; a very usable space’ (Staff Interviews). Day rooms in wards have been highlighted in the staff interviews as a key space for supporting activities of daily living, as well as providing a space for family members to go with patients. Staff in the Curragh ward in Naas shared that their day room is an ideal space for family members to bring a patient ‘to eat, have tea’ (Staff Interviews). However, availability of day rooms throughout the inpatient wards in Naas hospital is inconsistent, with staff interviews in the Imaal ward noting that don’t have ‘a day room...there is a space (for families to use) but it is too small; that said – and owing to the proximity of the Imaal ward to the Day Hospital – the original idea was to share the space, but it doesn’t happen...and patients eat beside the bed’ (Staff Interview).



**Figure 7.47:** Busy corridor in an inpatient ward.

## Priority Theme: Interior Design of Space

### “The colour blue on the walls in calming” Patient

Responses with respect to interior design of spaces from Tallaght and Naas show an interesting split, with most favourable responses coming from patients and APs. Specifically, patients and APs perceived the internal environments in Tallaght, and Naas as bright, clean and calm. On the other hand, the responses from the staff interview reflect a less than favourable perception of the interior design of spaces. The discrepancy between patients and APs and staff perceptions with regards to the impressions of the interior design of spaces points to patients and AP low expectations of the hospital/built environment. With respect to Peamount, no specific comments related to the interior design of spaces were registered across the stakeholder engagement process with patients and staff.



### Building Components

Figure 7.48 highlights the following: the provision and degree of comfort of seating throughout the hospital; signage; décor; the public announcement system; the presence of TVs in waiting areas; and, wheelchair availability.



Figure 7.48: Stakeholder ratings on building components.

Challenges with regards to the signage, seating, and availability of wheelchairs are discussed below.

### Priority Theme: Issues with Signage

Findings show a less than favourable rating overall with regards to signage throughout the hospitals in each of the building analysis case study sites. In both Tallaght and Naas, a total of 19 respondents stressed that signage is problematic due to the number of signs (i.e. too few vs too many), the size of the signs, as well as their positioning and visibility, and the use of hospital terminology. In addition, the signage that is used to identify each floor contains conflicting text with respect to the numbers of floors, i.e. in Tallaght ‘First Floor is Level 2 and Second Floor is Level 3’ (Stakeholder Interview), and this leads to confusion with regarding a person’s location within the hospital – ‘ground floor is like a maze’ (Stakeholder Interview). In both Tallaght and Peamount, staff interviews revealed that lack of signage leads to patient/AP confusion. Specific to Tallaght, staff interviews noted the need for ‘improved signage in the OPD...and generally along the hospital street’ (Staff Interview).



Figure 7.49: Image of inconsistent signage.

### Priority Theme: Issues with Seating

This priority theme is specific to both Tallaght and Naas where respondents noted availability (i.e. due to volume of people in the hospital) and comfortability of chairs as an issue. Specific to Tallaght, the ebb and flow associated with the age-related health outpatients clinic can result in a lack of available chairs in the waiting area, due to the volume of individuals in the space during a busy clinic; in addition, respondents noted that ‘if you are waiting for a long time during your appointment, this has an impact on’ the comfortability of the chairs (Stakeholder Questionnaire). Specific to the waiting area in the Tallaght ED, one respondent stated that ‘seating in A&E very bad for waiting hours’ (Stakeholder Questionnaire). Specific to Naas, with respect to the need for more seating throughout the hospital, respondents noted the need for this seating to be in a quiet area, especially for distressed patients. Lastly, for individuals with mobility issues, seating is perceived as difficult; in the case of the seating in the Naas Day Hospital, seating should be

higher, to make it easier for older persons, including those using canes, to get up and out of (3 respondents).

**Priority Theme: Wheelchair availability**

Availability and ease of locating a wheelchair was rating poorly in both Naas and Tallaght, with a higher proportion of APs and patients in Tallaght providing a rating of 'Bad' in relation to this question. Specifically, patients and APs requiring a wheelchair when arriving at the hospital find it difficult to locate one; to underline the impact of poor wheelchair availability, one respondent from Tallaght Hospital added that if wheelchairs were freely available, this would, in her case, reduce the need for multiple carers, from two to one.

### Internal Environment

Figure 7.50 includes ratings on following internal hospital environment issues: comfort level with respect to heating; degree of fresh area and ventilation; lighting; noise; smells; and, overall impressions on the degree to which the internal environment is calm and pleasant.

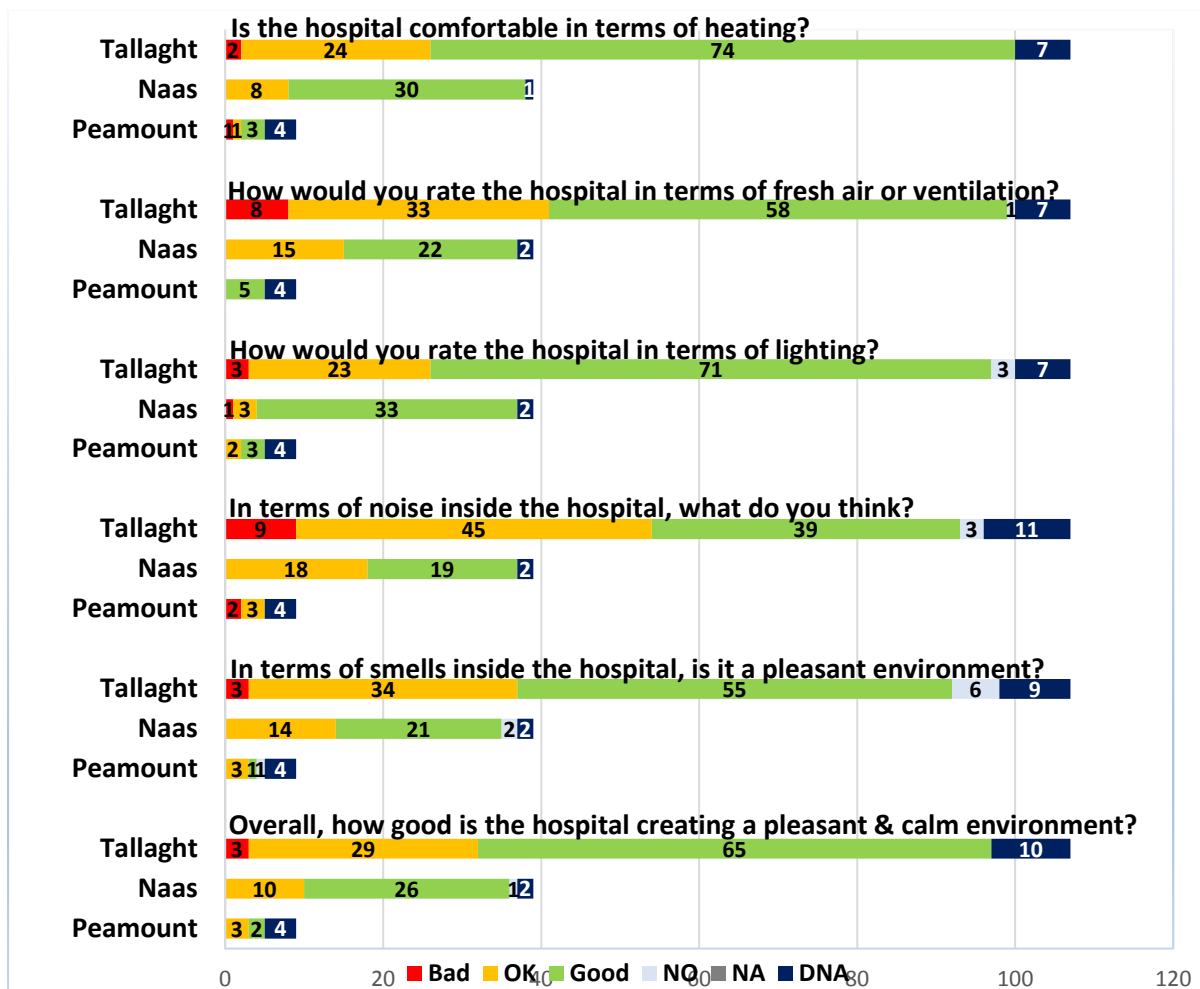


Figure 7.50: Stakeholder ratings on the internal environment.

Overall, respondents rated internal hospital environment favourably; however, despite the generally favourable ratings, the thematic analysis identified challenges related to the internal environment and noise levels; these are discussed below.

#### Priority Theme: Challenges regarding the internal environment

While the internal environment might be described as too hot for some, it may be too cold for others, and still, others may find it just right. Staff interviews across all three building analysis case study sites noted that the internal environment needs to be better balanced; however, one staff interview in Tallaght noted that it ‘can be warm but cannot regulate

[temperature] by opening windows due to regulations related to infection control’ (Staff Interview).

### **Priority Theme: Noise Levels are an Issue**

Staff feedback noted that noise levels are high on the wards in both Naas and Tallaght. Staff noted that noise leads to ‘disorientation and stress’ for in-patients; furthermore, one staff member acknowledged that ‘quieter ward area for elderly patients would lead to better treatment (Staff Interview). While the staff interviews in Peamount did not raise any particular issues in relation to noise, a number of the stakeholder questionnaires noted the patient alarm system as an issue.

### **7.7.3.3. Group 3: Barriers and Facilitators**

Dementia friendly design requires a change in mind-set and the adoption of different design approaches, that in many ways align with good design practice. Nevertheless, it is important to recognise both the potential barriers and facilitators that exist in the hospital context.

#### **Barriers**

Several challenges to implementing a dementia friendly design approach were identified from the stakeholder engagement process and thematic analysis. These included:

- **The complexity of the hospital environment** - Diverse stakeholders, multiple hospital services, various strategies, standards, and regulations, along with complicated procurement policy, all combine to create a complex environment where real and perceived obstacles can hinder change.
- **Physical Constraints of existing building** - Physical characteristics of the existing hospital combined with the inherent inflexibility of most construction (i.e. heavyweight materials, structural issues, building services etc.), constrains many potential environmental changes.
- **Cost** - Due to typical construction methods involving heavyweight materials and structures, building is often a costly process. This is compounded by the high costs typically associated with hospital construction.



- **Disruption** - Disruption to patient care is a significant obstacle to carrying out building works in a hospital due to operational pressures and increasing numbers and patient flow.
- **Initiative or improvement fatigue** - Constant service improvement concurrent initiatives to improve patient care can lead to 'initiative fatigue' or 'quality improvement overload' where management or patient-facing staff are less willing and able to implement changes.
- **Challenges around staffing levels** – In some cases, dementia-friendly spaces and activities within a hospital may require higher levels of staffing. Difficulties with respect to existing staff shortages and staff recruitment, as well as restrictions related to cost, can be a barrier to the effective implementation of a dementia-friendly approach in the hospital setting.
- **Attitudinal or cultural barriers** - Change is often simply impeded by attitudes and cultural issues. While some physical alterations may not be that expensive or disruptive, they may be opposed due to a lack of consensus or people's resistance to change.

## Facilitators

To offset the challenges imposed by the barriers identified above, the thematic analysis also identified a number of facilitators to support the implementation of dementia friendly design. These included:

- **Positive societal and policy developments regarding ageing and dementia** - Specifically, strategies which promote and support a positive ageing process (such as the National Positive Ageing Strategy), and a greater awareness of dementia can act as facilitators in the implementation of dementia-friendly design.
- **Level of staff enthusiasm and knowledge** - Including staff as catalysts in all aspects of dementia friendly design can not only support ease of implementation of a dementia-friendly approach, but it can also act as a counter-measure to the attitudinal or cultural elements present in the hospital environment.
- **Capitalizing on synergies between various hospital improvement initiatives** - It is important to take stock of where the key synergies between a dementia friendly design approach and hospital improvement initiatives lie, and where to exploit them for the benefit of patients and families, staff, and visitors.

### 7.7.4 Conclusion

The findings of the thematic analysis are organized across the following three thematic categories: underlying issues; themes linked to specific spatial scales; and barriers and facilitators. As expected, the findings point to the fact that hospitals are often chaotic and challenging environments for most people at the best of times. With the exception of Peamount (i.e. inpatient, longer-term rehabilitation stay) the reasons for being at the hospital can vary from an appointment at the age-related health outpatients clinic in OPD, or as an attendee at the DH, to a more serious health issue that requires a patient and their AP to arrive at the ED for immediate care. The different experiences of people entering and moving around the hospital will have an impact on their wayfinding abilities. For an older person, or a person with dementia, the degree to which this environment can be disorientating or confusing, highlights the importance of dementia friendly approach, one underpinned by Universal Design principles.

One of the key elements of Universal Design is that it puts the users, in this case, the person with dementia, and the APs at the centre of the design process. The research team notes that there is a difficulty with respect to eliciting information and feedback from the person with dementia in relation to their experience of moving around the hospital. In most instances, the presence of an APs is to assist in wayfinding and orientation in the hospital; however, in some cases, the person being accompanied may rely entirely on their APs to navigate the hospital environment, and in so doing, they themselves do not actively engage in wayfinding. In other words, as the person is not travelling independently around the hospital, the degree to which they find it easy to navigate and find their way around the hospital cannot be determined concretely.

Linked to the above is the recognition that the relationship dynamic between the person with dementia and the AP can be complex. Over the course of the interviews, the research team observed patient and AP dynamics where the patient with dementia was encouraged to provide feedback and their opinion on their hospital visit; however, as the interviews progressed, the APs provided the majority of the feedback. One could argue that the reason for this was not so much a desire to dominate the interview, but rather that the APs felt compelled to provide answers, from both their own perspective, as well as their family member. In addition, it is possible the patients themselves may have been completely comfortable with their AP speaking on their behalf. For example, in one interview where the

research team sought the input from the patient, the patient responded that their carers ‘will speak for me’.

With respect to the themes linked to the various spatial scales, a number of findings, some surprising, have come to light. Based on the data and themes presented in Table 7.3 it is interesting to note the issues which came up most frequently for patients, APs and carers, and those which were raised by staff. Specifically:

**Table 7.4:** Top 5 issues for patients/APs (based on total frequency, across all case study sites) (n=154):

Issue	Frequency
Traffic Volume and Parking Generally	63
Wayfinding and Orientation Challenges within the Hospital	53
Issues with Signage	32
Problems with the Carpark Building (Tallaght-specific, n=107)	26
Problems with Main Entry Doors	23

**Table 7.5:** Top 5 Issues for Staff (based on frequency, across all case study sites) (n=47)

Issue	Frequency
Lack of Space	49
Wayfinding and Orientation Challenges within the Hospital	29
Dedicated Entrances to Specific Areas of the Hospital	17
Interior Design of Space	11
Issues with Signage	11

It is not unexpected that the issues raised by patients and APs would span both the exterior and interior built environment, while the majority of most frequently raised issues by staff would focus on those spatial scales linked to the internal built environment.

Despite rating certain elements of the hospital environment as poor, when accompanying persons and patients were asked to rate their overall experience in the hospital, the overwhelming response across the sites was a positive one. This points to a low expectation by APs and persons with dementia of the built environment, as well as an inability to separate the built environment from the service received. Furthermore, this good service is conflated with the experience of the built environment.

Further discussion on these and other key findings, bringing together the findings from the literature, the thematic analysis, and exemplar case studies is presented in Part C of the report – Key Findings and Discussion.

## 8 Stakeholder Engagement: Ad Hoc Interviews, Workshop, and Survey



### 8.1 Introduction

Stakeholder engagement is one of the key elements of the mixed-methods methodology underpinning the research undertaken in this project, as evidenced by the comprehensive stakeholder engagement exercise completed as part of the building analysis for each of the case study sites selected for this research project. Detailed information regarding the breakdown of stakeholder groups and data collection tools across the three building analysis case study sites is described in Section 7.7.2. Further to the stakeholder engagement process described in the previous chapter, the project research team has had occasion to meet, speak with and engage with stakeholders beyond those linked to building analysis case study hospital sites. In recognition of this, and building on the stakeholder engagement



process undertaken throughout this project, this chapter details and presents findings on the following additional stakeholder engagement elements:

- Ad hoc interviews and other forms of engagement from stakeholders: this includes people with dementia and their families and carers outside the scope of the engagement undertaken in each of the case study sites; facilities management and technical services management personnel not affiliated with the building analysis case study hospitals.
- Stakeholder Workshop: the findings from the workshop are presented herein.
- Facilities Management and Technical Survey (On-line survey): building on the ad hoc interviews outlined above, the research team have liaised with Estates and Facilities and Technical Services Department staff in a number of Irish acute hospitals. An on-line survey was developed and circulated (via Survey Monkey) to elicit their input.

Following a short description of each of the above listed components, key findings are presented in section 8.5. The key findings follow the structure of the previous chapter, and are organized into the following three groupings: Underlying Issues; Issues according to Spatial Scale; and, Barriers and Facilitators.

## 8.2 Ad Hoc Interviews

Over the course of the 2-year project, the research team had occasion to visit a number of Irish hospitals, conducting meetings and ad hoc interviews with various stakeholders, including: people with dementia and their family members and/or carers; patient-facing staff; and, Estates and Facilities and/or Technical Services staff. For each meeting, a research team member transcribed notes, and these have been reviewed to identify key themes and issues. The key findings are presented in section 8.5.

Specific to the interviews undertaken with Facilities Management and Technical Services staff, key issues and themes were drawn out and are presented in section 8.5. Furthermore, and as previously mentioned, one of the key outputs from the engagement with Facilities Management and Technical Services staff, was the development of an online survey, which is further discussed below in Section 8.4.

## 8.3 Stakeholder Workshop

As part of the research project, a stakeholder workshop was scheduled to take place during the second year of the project. The aim of the workshop was to present the outputs of the research to-date, elicit feedback from various stakeholders regarding their experiences of the built environment in the acute hospital setting, and elicit input on the development of the proposed Dementia Friendly Hospital from Universal Design Approach Guidelines.

### A. Workshop Attendees

Approximately 50 invitations, targeting organizations representing key and relevant stakeholders at the local, national, and international level, in the area of dementia healthcare delivery, design, and policy, were circulated to, among others, participants from each of the research project case study hospitals, representatives from HSE Estates, and participants from hospitals engaged in the 2014-2017 HSE and Genio Dementia Programme. A total of 20 participants from the following organizations took part in the workshop.

- Tallaght Hospital, Dublin 24.
- Naas General Hospital, Kildare.
- Connolly Hospital, Dublin.
- Mercy Hospital, Cork.
- St Joseph's Shankhill.
- The National Disability Authority's Centre for Excellence in Universal Design.
- O'Connell Mahon Architects.
- HSE Estates.
- Hospice Friendly Hospitals Programme.
- Clinicians for Design (UK).
- Integrated Programme for Older People.

### B. Specific Workshop Objectives

The objectives for the workshop were as follows:

- Introduce stakeholders to the project.
- Introduce challenges for people with dementia in the acute hospital setting and outline the main design Issues.
- Illustrate the benefits of Universal Design in the context of dementia friendly hospitals.
- Present dementia friendly hospital design key findings.
- Introduce Proposed Guidelines.

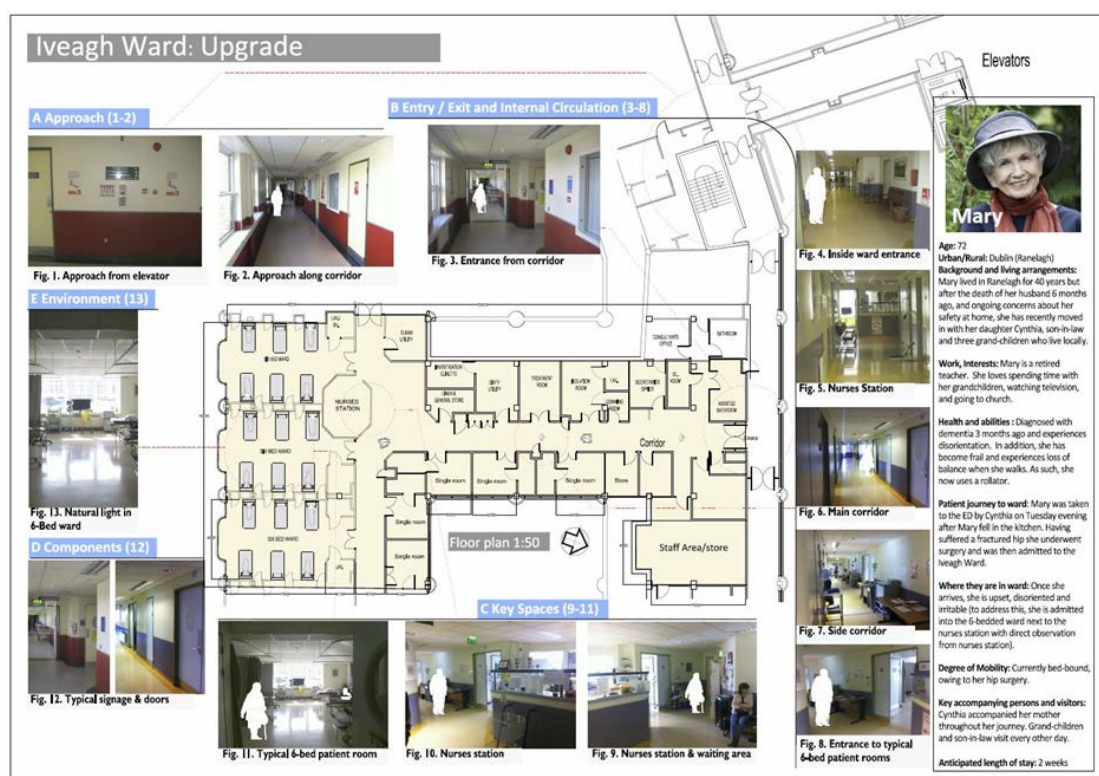
- Conduct stakeholder exercise involving a typical inpatient ward to get feedback regarding the key the issues faced by people with dementia in the hospital environment and to provide the attendees with an opportunity to give input regarding the overall structure and format of the guidelines.
- Facilitate an open discussion to capture any additional issues not covered in the presentations, handout or exercise.

### C. Stakeholder Exercise

The exercise was conducted to help attendees reflect on the typical issues that may arise for a person with dementia in the hospital setting in the context of their experiences, offer a chance to discuss these in a multi-disciplinary setting, and provide a specific exercise based on a realistic ward setting and patients to examine these issues and suggest design solutions.

For the exercise:

- Stakeholders were organised into four separate tables each with 4 or 5 individuals (mixed disciplines)
- Each group were given an A0 drawing containing a plan and photos of an existing hospital ward; for the purposes of this exercise, the ward was renamed as the hypothetical 'Iveagh Ward'. This drawing also contained a specific persona to represent a patient that would be treated in this ward for a period of time (see Figure 8.1 below).
- All attendees were given an excerpt from the proposed guidelines and a feedback template that set out the main questions and provided space for comments and recommendations to be collated by the research team.
- The attendees were asked to work both individually and as a team to provide written feedback via the templates and drawings, and verbal via a rapporteur, on the following questions:
  - A. What key difficulties would your persona or accompanying person experience in the Iveagh Ward? (Each group member to identify approx. 10 issues, and then the group to select top 10 issues across all input)
  - B. Based on the key dementia friendly hospital design issues, suggest changes around the two following areas in the ward for your persona: 1) Improving orientation and navigation; 2) Redesign or reallocate one key space within the ward to improve conditions for your persona. (Each group member to identify 5, and then the group to select a top 5 from all input)



**Figure 8.I:** Stakeholder workshop material: Persona exercise, including ward outline.

The research team recorded verbal feedback in written form and collected completed feedback templates and drawings with notes and post-its for post workshop analysis. Findings from the stakeholder workshop are organized according to the following spatial framework: A) approach; B) entry/exit and circulation; C) key spaces; D) Components; and E) Internal Environment. The breakdown also includes the frequency with which various issues arose to illustrate the occurrence of these issues in the working lives of the stakeholders.

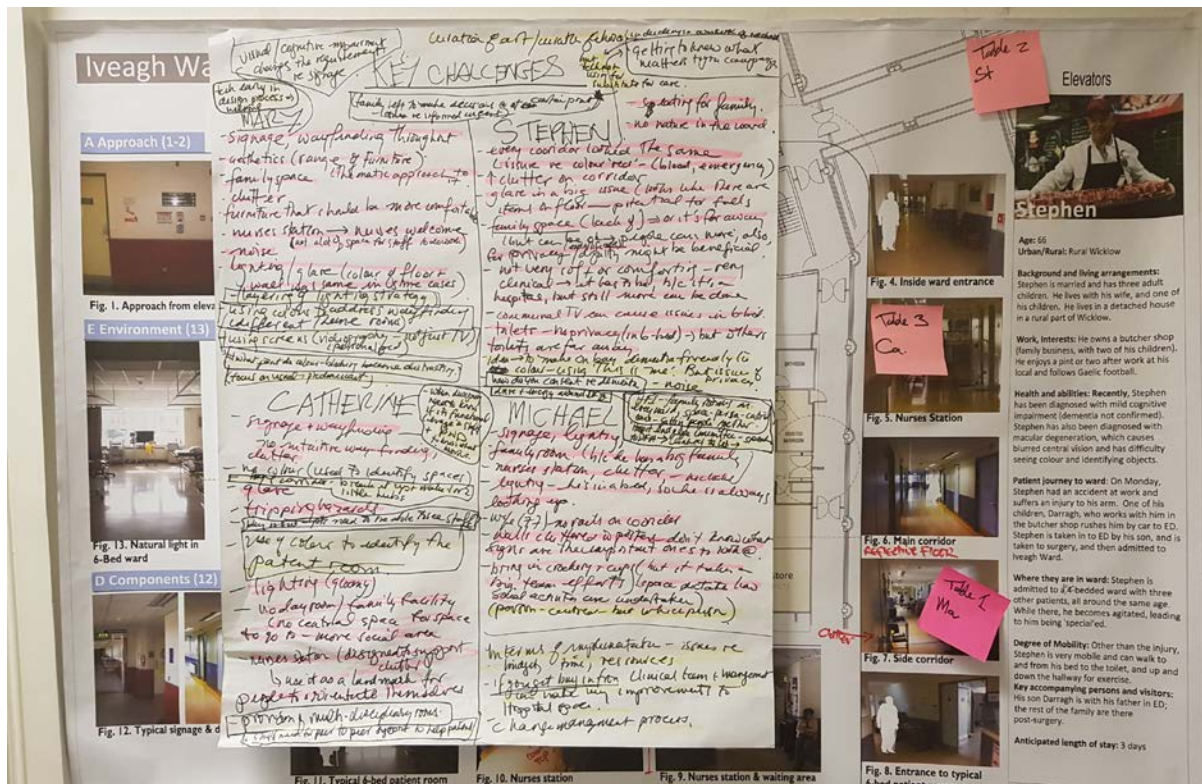


Figure 8.2: Stakeholder workshop themes.

## 8.4 Facilities Management and Technical Services Online Survey

Considering the central role of the Estates and Facilities Management and Technical Services Departments in hospital the research team worked with this stakeholder group to understand the main issues around dementia friendly design in hospitals, and the implications for making any physical changes to incorporate this approach. In this regard, an online survey (via Survey Monkey) was developed to engage with and elicit input and feedback from professionals working in these departments.

The survey is organized according to the following sections:

- Overall Hospital Information
- Respondent Information
- General Information
- Dementia Friendly Design in the Hospital
- Facilitators and Barriers to Making Changes to Supporting People with Dementia
- Other Issues



The survey was circulated to approximately 74 respondents. 13 were returned. Of those who returned responses, 12 completed the full questionnaire, while one respondent only completed the first two sections regarding overall hospital information and respondent information. Of the responses gathered, 9 are in relation to urban-based hospitals, 1 in relation to sub-urban based hospitals, and 2 are in relation to rural hospitals. The data collected via the survey was analysed and grouped into key themes and issues; the key findings from this analysis is presented in the next section.

## 8.5 Findings

The research team collated all feedback from the stakeholder engagements components outlined herein, and drew out key themes that captured both the issues or challenges that would be faced by a range of people with dementia in the hospital environment. The findings are presented below, organized into the following three groups:

- Group 1: Underlying Issues
- Group 2: Themes Based on Spatial Scales
- Group 3: Barriers and Facilitators

### 8.5.1 Group 1: Underlying Issues

#### **The importance of patient-centred care**

As noted in the findings from the thematic analysis across the three case study hospitals, many staff members emphasised that patient-centred care and due consideration for family members or APs must be at the heart of any hospital. The importance of a patient-centred approach was reinforced during the stakeholder workshop; however, during discussions, a number of participants highlighted the need for an inclusive approach – ‘person-centred, but what person?’ (Stakeholder Workshop). With this in mind, Universal Design was identified as important to provide inclusive design catering to a wide range of patient, visitor and staff needs. While person-centred care informs design, and design supports this, it is also important to ensure that design needs not be too specific; in this vein, Universal Design can play an important role, both with respect to how it underpins dementia friendly design, and also, with respect to linking patient-centred care with a design approach that addresses and supports the needs of a range of patients, including those with dementia, and their families, carers and APs.

On a related note, interviews with Facilities Management staff highlighted the importance of Universal Design as a catalyst for dementia friendly design when considering hospital refurbishments and developments.

### **Challenges Around Participatory Design**

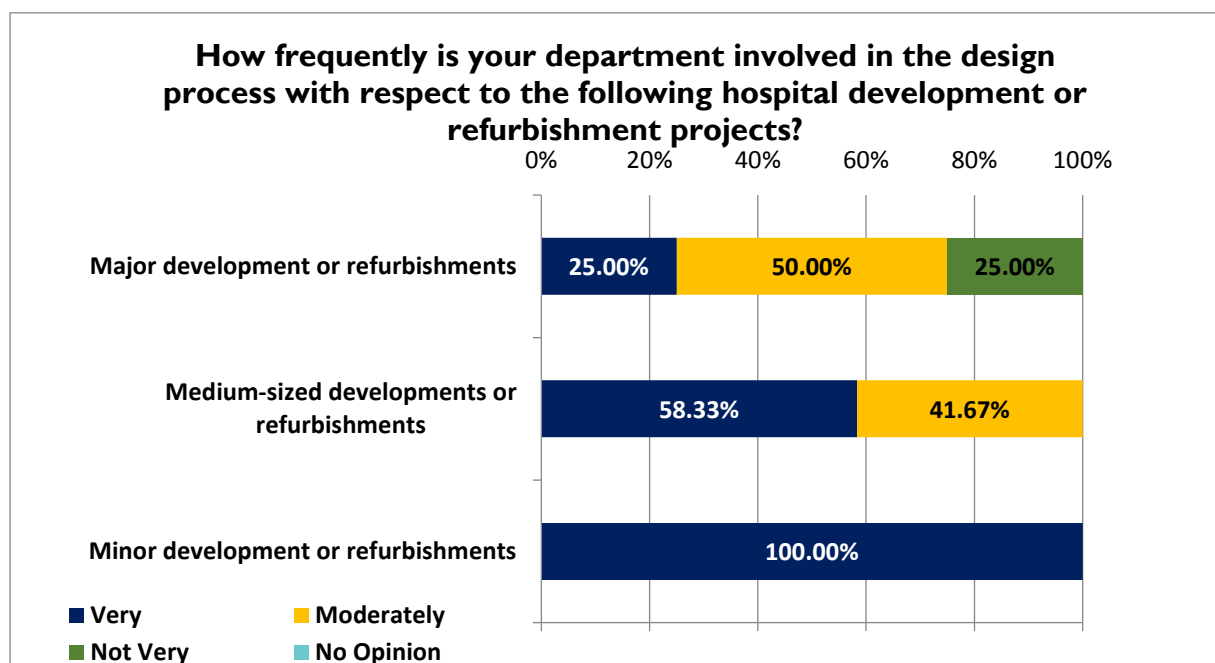
In addition to challenges around participatory design with respect to engaging with people with dementia (see section 7.7.3.1), input from the stakeholder workshop noted that a key component to effective participatory design involves the need for greater stakeholder engagement, especially buy-in from management.

Interviews with Facilities Management and Technical Services hospital staff identified the need for and the importance of a clear terms of reference, constraints, and scope of works for the project. Specifically: ‘in addition to the project manager’s responsibilities, the responsibilities of the stakeholder must also be emphasised. This includes: working within the agree scope of the project; having realistic expectations; contributing in an honest and transparent manner, participating in a timely fashion; and most importantly agree to accept certain decisions as the project proceeds and commit to these decisions’ (Ad Hoc Interview). Results from the online survey also advocate for a carefully managed stakeholder engagement process, with over 90% respondents noting it as very important in relation to providing better hospital design.

In addition, in any building development project the detail and accuracy of the tender documents is critical to the success of the projects: ‘if the project manager supplies insufficient detail or inaccurate tender information as part of a building project, the responding design team cannot prepare an optimum design, and therefore the quality of the resulting finished building will suffer’ (Ad Hoc Interview).

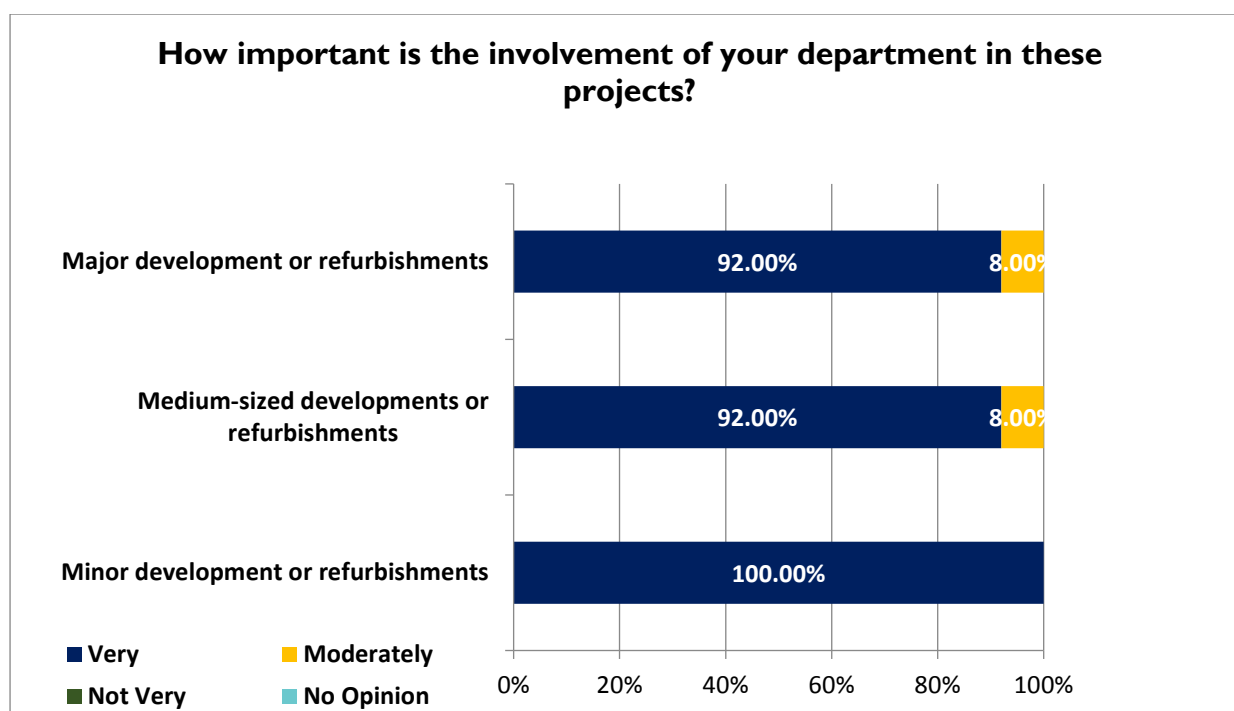
Lastly, data drawn from both the ad hoc interviews and the survey highlight that it is sometimes the case that Facilities and Estates Management and Technical Services Departments are not fully engaged in the design stage of a hospital development/retrofit project. The following figure provides a breakdown (in %) regarding the survey responses provided in relation to the degree to which Facilities and Estates Management and Technical Services Departments are involved in minor, medium-sized and major hospital developments and refurbishments. With respect to minor refurbishments and development,

all respondents indicated that Facilities and Estates Management and Technical Services Departments are very involved; however, in relation to both moderate and major refurbishments, the graph shows a steady decrease in involvement, i.e. Facilities and Estates Management and Technical Services Departments are ‘very involved’ in only 58% of medium-sized and 25% of major refurbishments and developments. Furthermore, in the case of major refurbishments, a further 25% are ‘not very involved’ in the design process at all.



**Figure 8.3:** Involvement in minor, medium-sized, and major developments or refurbishments in the hospital setting.

By comparison, an overwhelming majority of respondents noted that they viewed their involvement across all three levels of development and refurbishment as very important (100% viewed it as very important for minor developments and refurbishments, while over 90% of respondents viewed their involvement in medium-sized and major developments and refurbishments as very important).



**Figure 8.4:** Importance of involvement in minor, medium-sized, and major developments or refurbishments in the hospital setting.

Taking these results into consideration, it would appear the experience and expertise of the Facilities and Estates Management and Technical Services Departments is not fully utilised, particularly in the case of medium-sized and major refurbishments and developments; according to an interview with an Facilities Management stakeholder, this can lead to “problems given that they (Facilities and Estates Management and Technical Services Departments) will be tasked with operating and managing the infrastructure once construction is complete” (Ad Hoc Interview).

Survey respondents provided a number of potential solutions to mitigate challenges related to participatory design and enhance stakeholder engagement. A key element of all suggestions to improve the design process and improve the stakeholder engagement element involved more effective communication between the project manager and Facilities and Estates Management and Technical Services Departments; furthermore, a project manager who understands who the stakeholders are, and endeavours to involve them in the project as early as possible is important. In addition, respondents also noted the importance of the following:

- “More involvement with designers during projects“

- “Taking on board the failings of previous developments, listening to and implementing stakeholders’ suggestions”
- “The streamlining of structures processes within Estates. The utilisation of members of Estates that have positive & high management potential early on in their career to allow for upward structured change”.
- “A process whereby a user group of the proposed new facility or upgrade should be set up;” ... [this user group would then] “actively engage with the Architect for a minimum of 3 months before a draft plan is produced. The draft plan can then be worked on to bring to final plan stage”.

### **8.5.2 Group 2: Themes based on Spatial Scale**

Overall, the themes and findings organised by spatial scale and discussed below reinforce the findings drawn from the thematic analysis of the three case study hospital sites; in addition, new themes and issues were identified, including the nurses’ station, and the lack of a clear reception area on the ward, and these are also discussed below. While the findings below concentrate on the ward environment, it is worth noting that results from the Facilities and Estates Management and Technical Services Departments survey reinforce the findings across the three building analysis case study hospitals with respect to the importance of dementia friendly design at each of the seven spatial scales – from site location, approach and entry, right down to building components. The majority of respondents identified that each of the spatial scales was important with respect to dementia-friendly design. A comment from one of the respondents further noted the following, with regards to the various spatial scales: “I have said “very (important)” to all above as the setting needs to be 100% purpose built for patients and visitors with dementia and for staff/carers caring for these people” (Survey Comment ). Of the seven spatial scales, the following three were viewed as the most important with regards to dementia friendly design: building entry and internal circulation; key external spaces (including gardens, courtyards), and internal environment (i.e. lighting, thermal conditions, noise levels); in each instance, 67% of respondents noted these spatial scales as ‘very important’ with respect to dementia friendly design.

#### **Location, Approach and Entry**



Feedback from workshop participants identified the following three issues as problematic in relation to location, approach and entry at the ward-level: lack of identity, including thematics, especially at entrance, lack of spatial hierarchy – “main street and corridor very similar” (Stakeholder Workshop Participant) – and lack of signage on approach.

One of the consistent concerns expressed at the workshop was the lack of identifying or distinctive features (colours, objects, art etc.) when approaching or within the ward. This results in anonymous and potentially disorienting spaces where it is hard to recognise one area of the hospital from another. As part of this identity issue is the inadequacy of orientation and wayfinding in the hospital street and within the confines of the ward. In this regard the use of colour, graphics, objects, art, furniture, and focused lighting and illumination at key thresholds and spaces were offered as potential solutions. Beyond spatial orientation, orientation to overall geographic location and to the time of day, month and season is also important. These aspects of orientation can be supported with clocks and calendars.

In terms of wayfinding (i.e. getting from A to B), the same features recommended above, such as colour, graphics, etc., are important, however this is also where well designed signage is crucial. Specific to the workshop exercise, the participants pointed to the lack of signage, or poor quality of the signage in terms of small text and inadequate degrees of contrast.

### **Entry, Exit, Circulation**

While identity, orientation, and wayfinding obviously impact circulation, other issues also arose during the workshop, such as: the excessive number of doors along the main corridor; the excessive length and inadequate width of the main ward corridor; and the lack of orientation features/lighting.

### **Key Spaces**

With regard to key spaces the majority of issues arising out of the workshop are consistent with the findings from the thematic analysis of the case study hospital sites outlined in the previous chapter, and include, among others: lack of space in shared ward (impacting on privacy, space for activities, and space beside beds); excessively clinic setting; a lack of familiar facilities; lack of visual/spatial orientation; and, a lack of contact/views to

outside/nature. Key insights with respect to this spatial scale regarding the lack of a day/family room, nurses' station, and the need for a welcoming space (reception), and access to outdoor spaces/nature are further discussed below.

The lack of a family or day room was deemed a major issue, as was the dearth of bathroom space and room generally within the shared 6-bed wards. The potential location of any family space would be problematic given current space constraints; nevertheless, it was suggested that a common space close to the nurses' station, but also well integrated with the main circulation area, might be the best solution. However, it is also worth noting that a family room or common space in a location further from the main patient areas may provide a destination point and encourage walking.

The nurses' station was also highlighted as problematic. Participants were critical of the current design and layout suggesting that the nurses' station was neither welcoming or patient-friendly. Concerns were raised that hospital wards typically have no obvious reception or information areas adjacent to the entrance, and that one must travel deep into the ward before finding the nearest thing in the form of a nurses' station.

There seemed to be consensus about the need to provide a welcoming space easily accessed by patients and visitors, however, the idea of a decentralised nurses' station was debated due to a concern that decentralised stations undermine the peer-to-peer support and staff interaction provided by the larger centralised location.

Lastly, with regards to access to the outdoors (nature, gardens) the research team met with a family member of a person with dementia who shed light on the importance of these spaces as therapeutic and calming environments. Specifically, the family member stressed the importance of outdoor space in hospitals, especially in the context of her mother who she noted was a keen gardener and enjoyed being outside. Having accompanied her mother on many appointments and visits to the hospital (with regards to her serious illness) she witnessed her mother experience stress and anxiety due to the busy hospital environment. On these visits, her mother often attended multiple appointments and spent a considerable amount of time in the hospital (during the one-day visit/appointment). One of the things her mother experienced was a level of disorientation and stress associated with multiple appointments in various parts of the hospital. On these occasions, when possible, she found

it helpful to remove her mother from the inside of the hospital to an outside space, where her mother could sit, ‘decompress’ and orientate herself before the next appointment.

## Components

In terms of individual components, the absence of handrails along the main corridor was identified as a major disadvantage. Lack of seating and orientation devices was also highlighted, while the issue of excessive clutter was again commented on. As outlined previously, inadequate and poorly designed signage was deemed a problem. Lastly, participants referred to clutter across a few spatial scales as a difficulty and suggested the removal of unnecessary features or objects, the concealment of non-patient access doors or other staff only items or spaces.

## Internal Environment

Regarding the internal environmental comfort, poor lighting in the form of excessive contrast and inadequate illumination in the ward setting was highlighted as an issue. The other main issue focused on glare and excessive reflectance from floor surfaces. To ameliorate this a layered lighting strategy, solar control and the use of better artificial lighting control were suggested.

### 8.5.3 Barriers and Facilities

The barriers and facilitators previously outlined in Chapter 7, are reinforced by the findings across the ad hoc interviews, stakeholder workshop, and the survey. The findings presented below, highlight some of the key aspects of the barriers and facilitators.

#### Barriers

Several challenges to implementing a dementia friendly design approach were identified from the ad hoc interviews, stakeholder workshop and the survey questionnaire. Overall, the findings reinforced and aligned with those drawn from the thematic analysis of the three building analysis case study hospital sites. These included:

- ***The complexity of the hospital environment*** – Diverse stakeholders, multiple hospital services, various strategies, standards, and regulations, along with complicated procurement policy, all combine to create a complex environment where real and perceived obstacles can hinder change. With regards to the results

from the Facilities and Estate Management and Technical Services Department survey, 64% viewed the complexity of the hospital environment as a very important barrier to the implantation of a dementia friendly design approach.

- **Physical Constraints of existing building** - Physical characteristics of the existing hospital combined with the inherent inflexibility of most construction (i.e. heavyweight materials, structural issues, building services etc.), constrains many potential environmental changes. 64% of Facilities and Estate Management and Technical Services Department survey respondents viewed the physical constraints of existing building as a barrier with respect to the implantation of dementia friendly design.
- **Cost** - Due to typical construction methods involving heavyweight materials and structures, building is often a costly process. This is compounded by the high costs typically associated with hospital construction. Slightly over half of Facilities and Estate Management and Technical Services Department survey respondents (55%) noted cost as a very important barrier; the remaining 45% of respondents viewed cost as a moderate barrier with respect to the dementia friendly design approach. It is worth reiterating the potential role of Universal Design as a catalyst in countering the arguments that may arise regarding the costs associated with dementia-friendly design (i.e. many UD interventions can be incorporated into a hospital setting at a minimal cost).
- **Disruption** - Disruption to patient care is a significant obstacle to carrying out building works in a hospital due to operational pressures and increasing numbers and patient flow. With regards to disruption, only 37% of survey respondents viewed this as very important barrier in relation to dementia friendly design implementation.
- **Initiative or improvement fatigue** - Constant service improvement concurrent initiatives to improve patient care can lead to 'initiative fatigue' or 'quality improvement overload' where management or patient-facing staff are less willing and able to implement changes. The majority of survey respondents (63%) viewed this as being only 'moderately' a barrier with respect to the implementation of a dementia friendly design approach.
- **Challenges around staffing levels** – In some cases, dementia-friendly spaces and activities within a hospital may require higher levels of staffing. Difficulties with respect to existing staff shortages and staff recruitment, as well as restrictions related to cost, can be a barrier to the effective implementation of a dementia-

friendly approach in the hospital setting. An equal number of Facilities and Estate Management and Technical Services Department survey respondents (45%) viewed this as either a very important or moderately important barrier with respect to dementia friendly design. The remaining 10% had no opinion.

- **Attitudinal or cultural barriers** - Change is often simply impeded by attitudes and cultural issues. While some physical alterations may not be that expensive or disruptive, they may be opposed due to a lack of consensus or people's resistance to change. Workshop participants pointed to the need to provide training to ensure that staff are supportive and knowledgeable about implementing changes was identified; furthermore, it was suggested that individualized guides for patients to explain the environment and point out key features might also help. 55% of Facilities and Estate Management and Technical Services Department survey respondents viewed this a moderate barrier in relation to the effective implementation of a dementia friendly design approach.

## Facilitators

Aligning with the findings with regards to the barriers listed above, the ad hoc interviews, stakeholder workshop and the survey questionnaire findings reinforced those drawn from the thematic analysis of the three case study hospital sites in relation to the identification of a number of facilitators to support the implementation of dementia friendly design. These included:

- **Positive societal and policy developments regarding ageing and dementia** - Specifically, strategies which promote and support a positive ageing process (such as the National Positive Ageing Strategy), and a greater awareness of dementia can act as facilitators in the implementation of dementia-friendly design. 90% of Facilities and Estate Management and Technical Services Department survey respondents viewed this element as very important in the context of implementing a dementia friendly design approach.
- **Level of staff enthusiasm and knowledge** - Including staff as catalysts in all aspects of dementia friendly design can not only support ease of implementation of a dementia-friendly approach, but it can also act as a counter-measure to the attitudinal or cultural elements present in the hospital environment. With regards to the results of the survey, 72% viewed this element as very important, while the



remaining 28% viewed it as moderately important in relation to the implementation of a dementia friendly design approach.

- **Capitalizing on synergies between various hospital improvement initiatives** - It is important to take stock of where the key synergies between a dementia friendly design approach and hospital improvement initiatives lie, and where to exploit them for the benefit of patients and families, staff, and visitors. Feedback from the stakeholder workshop argued that, considering the many improvement issues that may be running at one time and budget constraints, any overlaps between initiatives should be fully exploited to avoid replication or unnecessary competition for the same funding (e.g. between hospice friendly and dementia friendly design). With regards to this facilitator, 82% of Facilities and Estate Management and Technical Services Department survey respondents viewed it as very important with regards to the implementation of a dementia friendly approach.

## 8.6 Conclusion

The findings across the ad hoc interviews, steering committee input/minutes, the stakeholder workshop, and the FM/TSD questionnaire results reinforce the findings across the three case study hospitals. Firstly, Universal Design was identified as important to provide inclusive design catering to a wide range of patient, visitor and staff needs. Furthermore, Facilities Management staff highlighted the importance of Universal Design as a catalyst for embracing the tenants of dementia-friendly design when considering hospital refurbishments and developments. Building on this, it may be interesting to consider the role that UD can play in terms of establishing the foundation on which a term of reference can be based, in order to counter the challenges of engaging with multiple stakeholders (each with their own professional 'language', expectations, and views of the built environment), thereby ensuring an effective and more meaningful participatory design process.

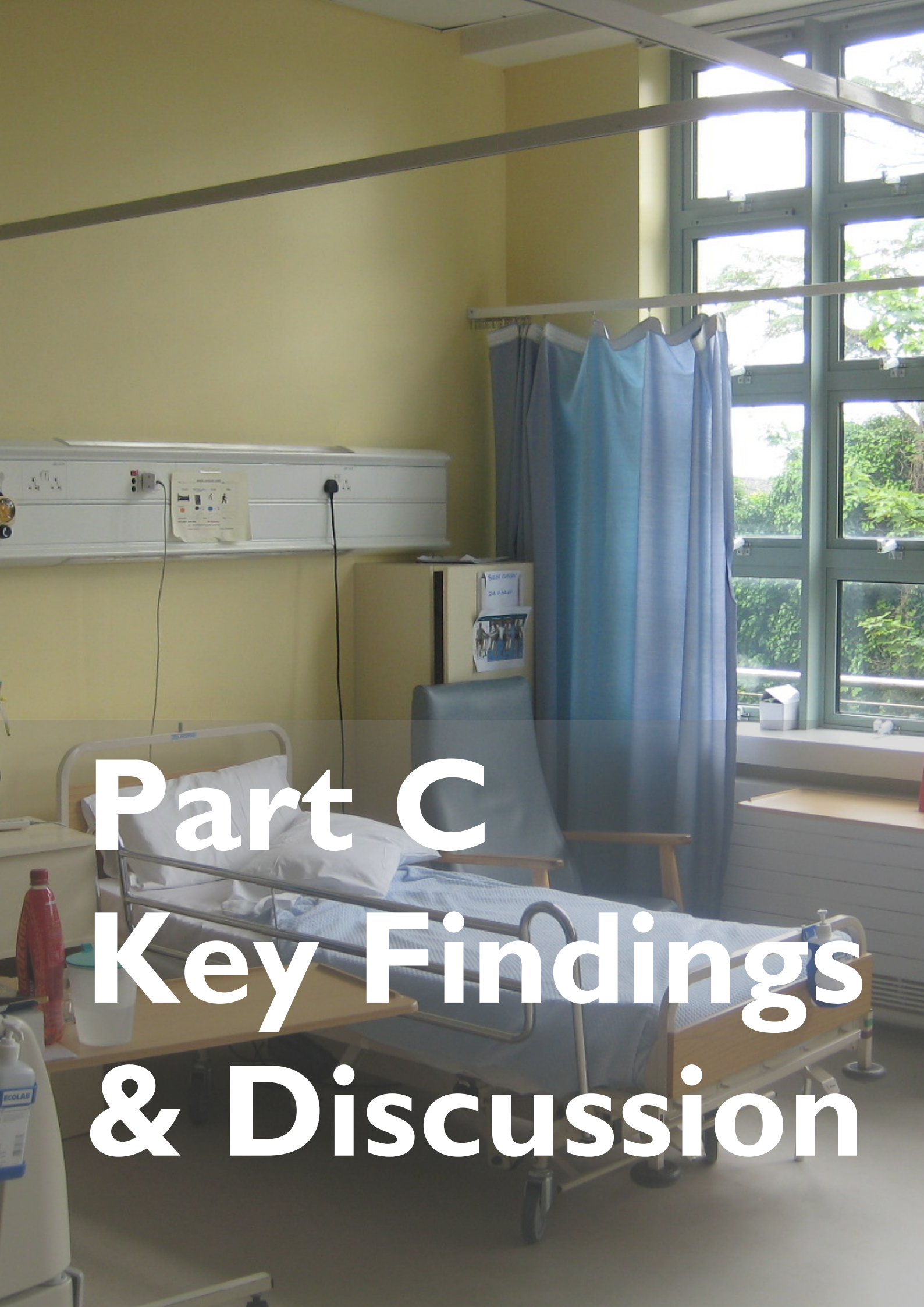
Building on the above, the findings in this chapter further point to the importance of a comprehensive participatory design process, one which identifies and includes all relevant stakeholders in the hospital environment to ensure effective implementation of a dementia-friendly design approach. The involvement of FM/TSD personnel at the beginning of the design process regardless of whether the refurbishment/development is minor, medium-sized, or major in scope, is view as paramount and a key component to an effective

stakeholder engagement process. Interview and questionnaire feedback from FM/TSD staff point to the lack of communication and engagement by the project manager with FM/TSD as a key challenge vis-à-vis participatory design; to counter or mitigate this challenge, FM/TSD staff recommend a more robust and open engagement process, one where the project manager is aware of all the stakeholders, and where stakeholders are engaged from the onset of the project. Furthermore, a clear terms of reference, including the constraints and scope of works for the project should be communicated to all stakeholders, ensuring that the responsibilities of the project manager and stakeholder are agreed to and understood throughout the course of the project.

With respect to spatial scale framework identified for the carrying out of this research, findings point to the importance of considering dementia friendly design at every spatial scale in order to better serve and cater for the needs of persons with dementia and their carers. With respect to the findings from the stakeholder workshop, the importance of a clear, distinct and recognisable reception area at the entrance of the ward, as well as a nurse's station visible to patients were deemed important elements when implementing dementia friendly design at the ward level. Furthermore, art, access to outdoor space, lighting, and day rooms were also identified as key elements of dementia friendly design approach, and should be incorporated into the ward environment.

Lastly, the findings in this chapter reinforce the list of barriers and facilitators that were identified across the three case study hospitals.

Further discussion on these and other key findings, bringing together the findings from the literature, the thematic analysis, and exemplar case studies is presented in Part C of the report – Key Findings and Discussion.



# Part C

# Key Findings

# & Discussion

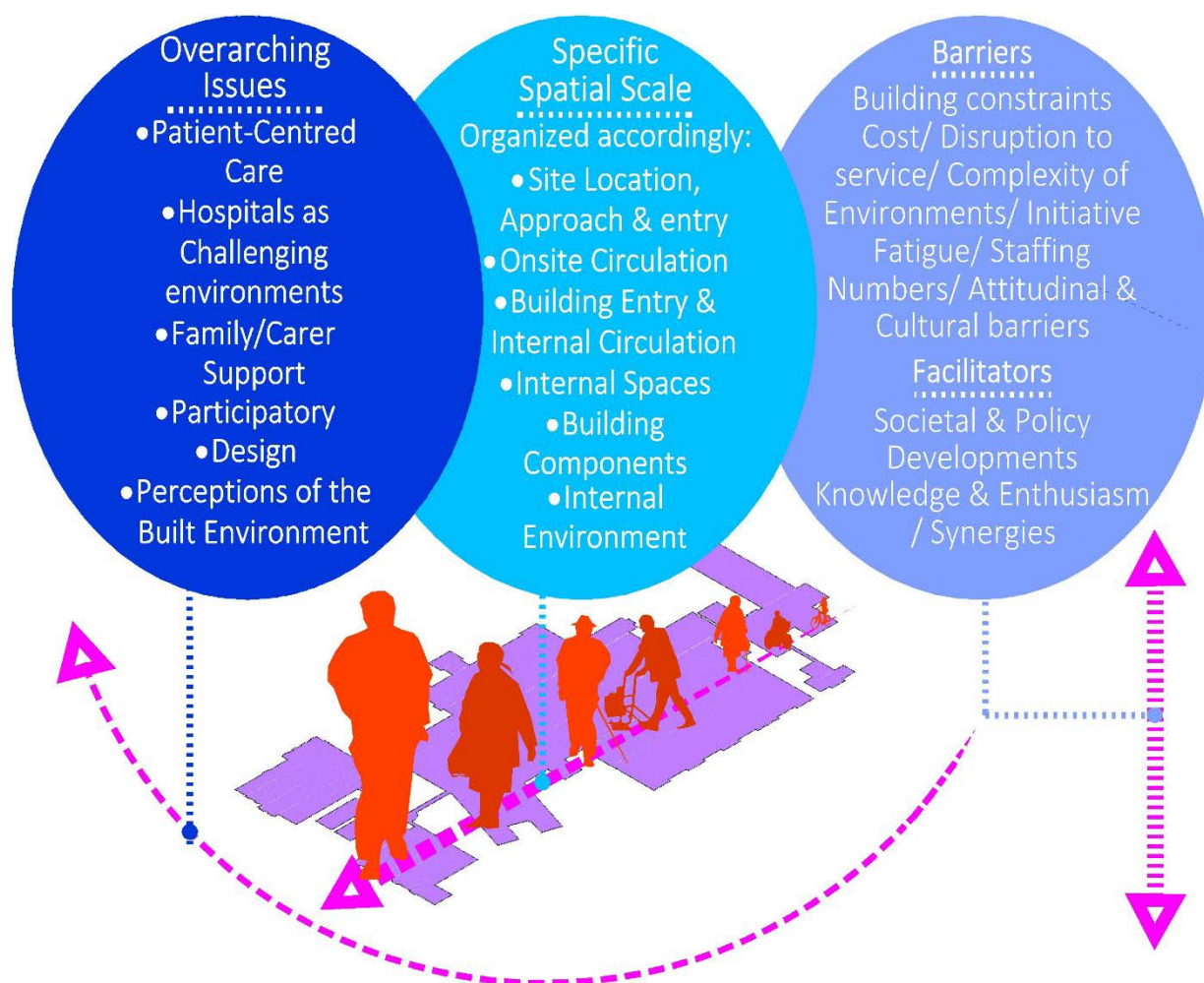


# 9 Key Findings and Discussion

## 9.1 Introduction

This final section selects a number of key findings from the literature review, the international case studies, UK and Irish exemplars, building analysis, and ad-hoc stakeholder engagement processes presented in the previous sections of this report. These key findings have been largely selected and grouped according to the following:

- 1) Overarching Issues
- 2) Key Design Issues and Identified problem areas across the principal spatial scales.
- 3) Barriers and Facilitators to implementing environmental changes or new design approaches.



**Figure 9.1:** Key findings grouped according to three groups

## 9.2 Overarching Issues

### 9.2.1 Patient-centred care should be at the heart of hospital design

As espoused by the WHO definition of health, defined as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1948), interviews across the three case study hospitals highlighted a concern by staff regarding the need for holistic and patient-centred care approach within the hospital. Focussing in on the needs of the patients, particularly those who have been diagnosed with dementia, ensures that the delivery of health care services is informed and driven by the needs of the patient. This focus in turn, has implications for the design of hospitals, particularly in the context of dementia friendly design in the hospital environment. Some of these implications – including challenges regarding participatory design processes, barriers and facilitators – are further discussed below; however, it is worth reminding the reader that one of the key elements of Universal Design is that it puts the user, in this case the person with dementia and their AP at the centre of the design process. Not only does this reinforce the importance of ensuring that the voice of people with dementia are at the forefront of the design process, but by putting the user at the centre of this process, Universal Design aligns with the principles of patient-centred care, reinforcing the need for a holistic approach with respect to the needs of the patients within the hospital environment.

In the context of a patient-centred approach and relational care, there are clear planning and design implications. These have been outlined in Section 3.5 and include among others the promotion of privacy, dignity and independence; engagement with friends and family, staff and community; and, participatory design, are central to a patient centred approach.

A patient-centred approach would also suggest that hospital should provide easy access and be well integrated with the community. The issues emerging from the literature in Section 3.6 illustrate the advantages of a central location, ease of access from the community, and the availability of alternative forms of travel including public transport and pedestrian access. While there are obvious sustainability benefits, there are also advantages for patients, family members or visitors who may not be capable of driving.

A community integrated hospital also raises questions about the reach of the hospital into the community and the kinds of off-campus services the hospital could provide for older



persons and people with dementia within the community. On this point, Genio funding notes

‘the focus is on the acute hospital sector to develop an integrated care pathway for people with dementia so that there will be capacity to avoid inappropriate admissions, accelerate supported discharges from hospital and diversion of patients from presenting to Emergency Departments through advance planning with community based health and social care supports. The integrated care pathway should ensure that when access to acute hospital care is required the access is planned and appropriate (whenever possible) and that there are clearly defined pathways into and out of acute care’ (p. 15).

A greater emphasis on people-centred and patient-centred design is demonstrated through the Irish and UK based dementia friendly design exemplars. While this is expected in retrofit projects with a dementia focus, it is even more encouraging to see this people- and patient-centred emphasis in the non-dementia specific contemporary exemplars. As outlined in Chapter 6, design in these hospitals has moved on from process-driven thinking that was more apparent in the recent past, to the creation of a more supportive and humane environment for all users. This results in a softer and less institutional environment that is integrated with the local context and more welcoming to the community.

Related design issues such as healthful or health-promoting hospitals are also relevant in this context and are discussed later in Barriers and Facilitators.

### **9.2.2 Challenges around Participatory Design**

The research findings highlight a number of challenges around participatory design, across multiple stakeholder groups. These are discussed below, broken down into the following two sections: (1) challenges for people with dementia and their APs; and, (2) challenges for hospital staff, facilities management and technical services departments.

#### **Challenges for people with dementia and their APs**

The importance of participatory design in terms of the design process and catering to the physical, sensory and psychological needs of patients; supporting a patient-centred approach; and, reinforcing patient empowerment, has arisen in the literature (see Section 3.5) and the exemplars (see Section 4.4).

However, the overall stakeholder engagement process has illustrated that there are many challenges around participatory design process and designing for people with dementia. As

noted in the literature, and further demonstrated by the findings across the case study hospitals, some people with dementia may have problems understanding and communicating their opinion regarding some of the complex issues relating to design the influence or role of the built environment. In addition, it is often the case that family members or carers will speak on behalf of the person with dementia and therefore it can be difficult to elicit direct feedback from the individual themselves. In one instance, during a structured interview with stakeholders in Tallaght Hospital, the person with dementia directed the research team to focus on his family as ‘they will answer for me’.

With regard to the first issue, declining communicative abilities of a person with dementia can create many barriers and challenges. In this regard the National Dementia Strategy (Department of Health, 2014) emphasises the provision of good quality information for persons with dementia and their carers, as fundamental to the promotion of individual health and well-being, and for living well with dementia. The provision of quality information notwithstanding, a key component in communicating effectively with a person with dementia, is the recognition that each person’s relationship with dementia is different; every person with dementia is unique and their behaviour cannot be solely attributed to the condition (Kitwood, 1997).

Considering the challenges around participatory design and people with dementia, it is important, as noted by Killick and Allan (2001) to ‘alter perceptions and attitudes to connect with this patient group in a more meaningful way’. Communication strategies underpinned by the ‘value-driven’ nature of person-centred care, particularly as it relates to promoting empowerment and agency of the person with dementia, may provide an effective way to counter the key challenge that declining communication abilities impose on participatory design.

Secondly, the relationship dynamic between the carer and the person with dementia can result in the input provided by the person with dementia being suppressed or overridden by that of the family member or carer. The dynamic highlights another means by which the person with dementia can be disempowered or left with reduced agency. Effective participatory design must consider this relationship dynamic and the extent to which it hinders or supports the person with dementia, as this in turn will contribute to the promotion of a meaningful engagement with all persons impacted and affected by dementia.

Another issue that has arisen from the engagement process across all three hospital sites concerns patients' and visitors' low expectations and general lack of understanding about the impact of the physical environment on their health and wellbeing. In some cases this is possibly due to an inability to separate the perceived high standard of care received from the built environment, while in other cases it may be that some people find it difficult to articulate their opinions about the physical environment in a complex setting such as the hospital. Whatever the cause, participatory design requires a certain level of concern, awareness and understanding in order to engage stakeholders in the design process. Where this awareness or understanding is lacking, efforts should be made to address these as it will result in a more effective and meaningful process of engagement.

### **Challenges for hospital staff, facilities management and technical services departments**

In addition to the challenges of engaging with persons with dementia and their APs as part of a comprehensive participatory design process, feedback from the stakeholder workshop noted that a key component to effective participatory design involves the need for greater stakeholder engagement, especially buy-in from management; on this latter point, findings from the Facilities Management and Technical Services Survey highlight the importance of a carefully managed stakeholder engagement process, including awareness by the Project Manager (responsible for hospital refurbishments/developments) of all stakeholders to be consulted as part of the participatory design process. Given that survey results demonstrated that it is sometimes the case that Facilities Management and Technical Services Departments are not fully engaged in the design stage of a hospital development/retrofit project, the importance of a comprehensive participatory engagement and design process cannot be understated. Full and comprehensive engagement by Facilities Management and Technical Services personnel will not only contribute to better hospital design, but also better management and maintenance of completed works in the hospital over time.

Ad hoc interviews with Facilities and Estate Management personnel also noted the role of Universal Design for embracing the tenants of dementia-friendly design when considering hospital refurbishments and developments. Building on this, it may be interesting to consider the role that Universal Design can play in terms of establishing the foundation on which a term of reference can be based, in order to counter the challenges of engaging with

multiple stakeholders - each with their own professional 'language', expectations, and views of the built environment - thereby ensuring an effective and more meaningful participatory design process.

Overall, it is essential that alternative participatory design approaches are investigated, tested, and used to ensure that firstly the voice of a person with dementia is heard in the design process, and secondly that it builds awareness and understanding for all stakeholders of the importance of the physical environment. To this end, an engagement process which (1) recognizes and includes all the relevant stakeholders, (2) outlines their role and manages expectations with respect to the design process, (3) is, at its foundation, based on the tenants of patient-centred approach, and (4) is built around a clear and accurate tender information, will have a higher chance of producing an optimum dementia-friendly design, for the hospital setting.

### **9.2.3 Hospital Environments are Challenging for People with Dementia**

Feedback from patients and staff across all three building analysis case study sites revealed a familiar aspect in relation to hospitals: they are busy and chaotic spaces that are especially difficult for a person with dementia due to the constant movement, activity and clinical nature of the setting. Findings from the literature reiterate the challenging nature of the hospital for people with dementia, in particular the sensory overload such as sound, the lack of familiarity, and disorientation and difficulties in wayfinding due to the large-scale, complex and often visually monotonous nature of the hospital.

Lack of respite space, including lack of, or where available, poor or unsafe access to outdoor garden space, or a lack of meaningful or daily activities were highlighted in both the stakeholder feedback, including the ad hoc interviews, stakeholder workshop and the stakeholder engagement process across each of the hospital sites, and literature as compounding factors. However, through initiatives as illustrated by the Irish and UK based dementia friendly design exemplars, this experience is improving. Notwithstanding, these projects are often restricted to small sections of the hospitals and are therefore limited in their impact. More encouraging is the approach adopted in many of the non-dementia specific exemplars, which presents a whole-hospital approach that provides a naturally more supportive environment for people with dementia as part of an improved experience for all users.

## 9.2.4 The Importance of Family/Carer/AP Support

Stakeholder feedback and the literature emphasise the important role of an AP to act as a familiar and trusted carer within the hospital. It has been demonstrated that this not only supports the patient by providing a level of comfort, calm, and consistency for the person with dementia, but it also assists the staff. Unfortunately, hospitals rarely facilitate an AP due to lack of space, lack of facilities, or through hospital policy that often forces the accompanying person to remove themselves during certain times of the day (i.e. mealtimes) or during certain procedures.

Notwithstanding hospital policy, which is often in place due to lack of space, the physical environment should be designed to provide space and support for one or more APs, where appropriate and feasible, to remain by the side of the person with dementia throughout their admission.

Furthermore, it has emerged from the stakeholder engagement process across the three building analysis case study sites that the AP, particularly a partner or sibling, may also be an older person themselves with age-related impairments. In this regard, the Universal Design approach that accounts for a wide variety of ages, abilities and disabilities, is an important consideration for in terms of design to support the AP.

The importance of family or caregiver support is reflected in the Irish and UK based dementia friendly design projects, through the provision of family rooms and better support for an accompanying person. This also appears in the non-dementia specific exemplars, where family rooms and social areas provide better facilities for accompanying persons. The provision of single-bed rooms in some of the Irish exemplars, and for the vast majority of non-dementia specific contemporary exemplars, automatically provides better support for an accompanying person. In some cases this is enhanced further by ‘family zones’ within individual rooms.

However, with the exception of the children’s hospital in Melbourne, other parts of the patient journey that may require the presence and support of an accompanying person are still not that well supported. Further research is required in this area.



## 9.3 Design Issues across Principal Spatial Scales

### 9.3.1 Dementia Friendly Design Issues

A set of key dementia design issues were drawn out of the literature in Chapter 3. Feedback from the onsite building analysis and stakeholder engagement process support these key design issues. Chapter 4 and 5, which examined the Irish and UK exemplars, also illustrate the relevancy of these design issues and shows that they are pertinent across different spatial scales and areas of the hospital. Furthermore, the non-dementia specific contemporary exemplars illustrate how good people centred and patient-centred design naturally aligns with and supports these dementia friendly design issues. To reiterate these key design issues they are listed below.

#### Support engagement and participation

1. **Promote engagement with friends and family, staff and community**
2. **Provide space and supports so that accompanying persons can remain with the person with dementia, where possible, throughout their time in the hospital.**
3. **Promote a participatory design approach: all key stakeholders contributing in a meaningful way to ensure their needs and preferences are incorporated into the design process**

#### Provide a people-centred environment

4. **Soften the institutional environment: more human-scale, less clinical or austere in appearance.**
5. **Familiar design: recognisable design that is easily understood and intuitive to use.**
6. **Facilitate personalisation: provide opportunities to add personal belongings such as photos to reinforce identity and help with orientation**

#### Support patient safety, wellbeing & health

7. **Provide a safe environment: unobtrusive safety measures that do not conflict with other issues such as privacy or the freedom to engage in physical activities**
8. **Support diet, nutrition and hydration: calm, accessible and usable spaces, furniture and tableware, along with appropriate visual cues and other stimuli such as food smells to encourage appetite.**
9. **Support meaningful activities: including physical, social, and activities of daily living (ADLs)**

### Balance sensory stimulation

10. **Optimise positive sensory stimulation (i.e. sunlight, music, artwork, images of nature etc.) while minimising negative stimulation (i.e. noise, glare etc.) as part of a calming and therapeutic approach.**
11. **Provide contact with nature and access to outdoor space to support active and passive therapeutic activities.**

### Support orientation and navigation

12. **Support orientation to date, time, location, etc. and improve spatial cognition.**
13. **Provide good way-finding that supports navigation; this is linked to orientation but is largely about finding your way around or getting from one place to another.**
14. **Provide good visibility and visual access: Optimise lighting conditions and make sure important features (e.g. handrails), spaces (e.g. toilets), and people (e.g. staff) are clearly visible**

### Adequate space to support the needs of a person with dementia

15. **Bed bays within shared rooms or single rooms, with enough space for personal belongings and adequate room for visitors.**
16. **Space for retreat in multi-bed wards (i.e. quiet sitting room for patients and family that can be used as respite from busy ward) and communal areas in single-bed wards to allow social interaction.**
17. **Provide space and supports for patient mobilisation and activities: including safe and stimulating walking or circulation routes.**

### Appropriate use of technology

18. **Appropriate use of technology for care delivery, safety or therapy (i.e. sensory stimulation)**

## 9.3.2 Dementia Friendly Design Issues and Spatial Scales

The research found that there are dementia friendly design issues relevant to the hospital as a whole, and at various spatial scales across the full spectrum of the hospital.

- **The hospital as a whole** - An integrated, coherent and therapeutic hospital is only possible when the building design is considered as a whole, and where careful consideration is not only given to each individual spatial scale, but also to the connection and interaction between these scales. This is particularly important when considering the

connecting public spaces that tie the spatial scales together - these external and internal connective spaces can be considered as the 'Public Realm' of the hospital.

The hospital as whole is experienced when a person enters from the community and travels across the hospital grounds, through the entrance and main public areas, into a specific department, and finally to the room or destination they are seeking. This continuum of places and spaces forms the public realm of the hospital, and extends from the adjoining locality, along a progressive hierarchy of public, semi-public, and private spaces.

While all spatial and physical features effect this public realm, it is important to consider the overall structure and quality of the public realm to ensure it is strong enough to provide a legible organising principle that also supports more detailed design strategies employed at various spatial scales. This public realm provides the main patient route through the hospital and forms the connective tissue of key spaces experienced along the way.

- **Site Location, Approach, Site Entry** - (e.g. hospital located within easy reach of older people, particularly those without means of private transport). Findings from the international case studies and the building analysis case studies illustrate the importance of location, approach and site entry for older people and those living with dementia. This scale has an impact on accessibility and usability, not only for the patient, but also for accompanying persons, or visitors, any of whom may not be a driver.
- **Campus Design and Onsite Circulation** - (e.g. planning and design interventions to improve accessibility, usability, and orientation for people with dementia and also provide greater support for carers-i.e. appropriate exterior circulation routes, external wayfinding, respite or resting areas etc.). Similar to the above, findings relating to site design and onsite circulation illustrate the importance of this spatial scale in terms of safe and comfortable pedestrian movement, adequate disabled parking, and the provision of appropriate set-down and parking facilities to support the accompanying person when they escort a person with dementia to an appointment, or to be admitted.

As illustrated in the best practice non-dementia case studies, the integration of outdoor space and nature as part of the hospital is becoming an important consideration. Careful design of the campus design is therefore critical if this level of integration is to be achieved.

- **Building Entry and Internal Circulation-** (e.g. interventions to improve ease of access, interior wayfinding and orientation, respite or rest areas, increased legibility through visual access, etc.) While the building analysis case studies highlighted major issues around wayfinding, orientation and legibility in existing hospitals, the Irish and UK dementia design exemplars tackle this issue through strong wayfinding strategies. In the non-dementia contemporary exemplars, issues around entry and internal circulation formed a major part of the design solution. The use of landmark entrances, clear and prominent internal circulation spines in the form of a public concourse or street, coupled with clear wayfinding, has started to create more supportive, coherent and legible hospital settings that provide natural cues to help people with dementia to orientate themselves and navigate throughout the hospital.

The best practice non-dementia case studies demonstrate that as acute hospitals become larger, it is possible to manage the impact of the scale and complexity of these buildings through careful massing of clinical blocks, establishing a hierarchy of scale and clear, legible circulation strategies within the building. The most people friendly buildings which have been analysed have a considered approach to grouping accommodation into legible blocks, designing departmental adjacencies with reference to patient flows, wayfinding and navigation, and implementing clear circulation which is legibly reduced in scale from Hospital Street to internal departmental circulation. Many of the buildings which are successful in this regard are extraordinarily large, such as the Royal Children's Hospital in Melbourne. These large sizes buildings could be considered as a collection of buildings, bound together by a shared internal public realm – a key internal space or concourse from which visitors to the building can orientate themselves.

- **Key Internal and External Spaces** (e.g. planning and design interventions that position spaces in appropriate locations, create calm and legible spaces that support easy orientation etc.) While the literature review and design issues outlined previously

identify the salient considerations regarding dementia friendly hospital design, findings from the exemplars and the building analysis case studies reinforce the importance of certain features such as family rooms, sufficient space for patient mobilisation, and the availability and access to outdoor space. The emerging trend around single occupancy rooms provides benefits in terms of greater privacy and a calm environment, but possible challenges regarding isolation and lack of social interaction. To ameliorate these concerns, wards must be designed with high quality social spaces within easy reach of all patients.

- **Building Components** (e.g. fittings, finishes, signage, technology, artwork etc.). For many existing hospitals, the retro-fit of building components such as finishes, signage or furniture, is the most manageable and cost-effective way to implement change. However, the most successful non-dementia exemplars also demonstrate the importance of building components in new-build projects, and those that closely align with the dementia friendly design issues illustrate careful and well-curated use of artworks, images, other visual elements.
- **Internal Environment** (e.g. thermal comfort, acoustic, and lighting interventions that address the cognitive and physiological needs of people with dementia). Somewhat surprisingly the building analysis case studies performed quite well in terms of acoustics. Other internal environmental conditions such as glare from natural light, disruptive night-time lighting, and poorly controlled thermal comfort and ventilation were more of an issue and require further research to develop appropriate and responsive indoor environment strategies.

Considering dementia friendly design for the hospital as a whole, as well as at various spatial scales is essential to any integrated and holistic hospital environment. In the context of Universal Design, the research findings show the importance of design considerations at these spatial scales to ensure that accessibility and usability are achieved across the full travel chain, from approaching and entering the hospital, right down to individual building components such as fittings or furniture. A high quality hospital public realm is critical to supporting this travel chain and to ensuring a dementia friendly and Universally Designed hospital setting.



### **9.3.3 Current Problem Areas: Building Analysis Findings**

The previous sections in this chapter have discussed Underlying Issues, the Key Dementia Friendly Design Issues, and design issues across the full spatial scale of the hospital. While these are all important in terms of an overall approach to dementia friendly hospital design, there are also a number of specific findings that arose from the building analysis case studies. These are of particular relevance to hospitals in the Irish context, and also in the context of existing hospitals. These are outlined in the next sections.

#### **9.3.3.1 Orientation to Time and Place**

Orientation to time and place has been selected as a key design issue and is discussed in detail in Section 3.5. The exemplars discussed in Section 4.4. also highlight orientation as prime concern and they illustrate design features to support a person with dementia in this regard. Across the case study hospital sites, disorientation was found to be a significant factor within the hospital environment, compounded by issues such as the size and complexity of the hospital, conformity of spaces, or a lack of orientating features such as clocks. In addition, bright artificial lighting at night within inpatient wards may reduce a person's ability to distinguish between different times of day, leading to confusion around appropriate daytime and night-time activities.

Lighting is an important issue identified in the literature and discussed in Section 3.5 in relation to positive sensory stimuli. Exposure to natural daylighting conditions support temporal orientation and help regulate circadian rhythms, which is essential for people with dementia who may experience unhealthy sleeping patterns. Innovative lighting that mimics natural daylight conditions or provides ambient lighting may be beneficial in this regard, such as the Philips 'Dynamic Lighting' and 'HealWell' lighting systems being tested in Bradford Royal Infirmary discussed in Section 4.3.

#### **9.3.3.2 Wayfinding**

Wayfinding is linked to orientation and is investigated as key design issue no. 12. In Section 3.5. The 'building block model' as outlined by Huelat (2007) is a useful framework that uses a series of hierarchical layers to examine wayfinding in a holistic manner across the spatial spectrum in the hospital. The exemplars presented in Section 4.4. also highlight methods to improve wayfinding and these could be used in conjunction with the building block model described above.

Overall, across the case study sites feedback demonstrates that navigation within the hospital is difficult, with patients and carers often seeking out hospital staff for directions. While it is important to highlight, particularly with regards to Naas and Peamount, efforts to improve navigation and wayfinding - through colour-coding to differentiate between floors, and colour-blocking to ensure entrance ways into different parts of the hospital are more recognizable (Naas), and differentiating between different corridors with colours and familiar images (i.e. yellow, sun; red, apple, etc) (Peamount) – stakeholder feedback in relation to navigation and wayfinding in these two case study sites was similar to that in Tallaght, particularly as it relates to seeking out and asking hospital staff for directions to facilitate their finding their way in the hospital environment.

Uniformity of spaces is a key issue that was identified by both patients/APs and staff, across all areas of the hospital in each of the case study sites. Furthermore, staff recognised the negative impact of the uniformity of spaces in terms of disorientation. Responses from the stakeholder workshop echoed the findings above, and, zeroing in on the ward environment, feedback focussed on the lack of identifying or distinctive features when approaching or within the ward, which can result in anonymous or disorientating spaces where it is difficult to distinguish one part of the hospital from another.

Across the three hospital case study sites, there was a poor rating for signage, with people reporting too many signs in certain places (leading to confusion), and too few elsewhere (resulting in a lack of information). Inconsistent signage information (i.e. a floor level labelled as both ‘Level 2’ and ‘First Floor’) and complex medical terminology used on signage was also an issue leading to confusion.

Staff showed high levels of awareness regarding the relationship between the built environment and wayfinding, pointing out the pressure it placed on patients and their carers. This awareness has been identified as a facilitator for the implementation of dementia-friendly design, and is further discussed in Section 9.4.

### **9.3.3.3 Patient Access to Hospital Campus**

Key design issue no. 5 demonstrates how location and local access to a hospital influence the promotion of engagement with friends, family and community. Furthermore, Sections 3.6.1 and 3.6.2 illustrate how planning and design in relation to location, adjacent urban

spaces, and entry to the hospital campus and can support accessibility and usability for a person with dementia.

While the issue of patient access to the hospital campus did not arise as an issue in Peamount owing to the fact that patients are transported to Peamount, primarily via hospital transport, access to campus arose as an issue in Tallaght and Naas respectively. In Naas, the key concern for patients and APs related to the location of the bus stop both in proximity to the hospital, and the road traffic on the road on which the bus stop is located. High traffic was perceived as negatively impact access to hospital via public transport; for an older person or a person with dementia, APs viewed the traffic as potentially dangerous and considered it too risky for their family member to travel to the hospital on their own to attend an appointment. With regards to Tallaght, while there is good public transport provision to the periphery of the campus, many stakeholders felt that the walking distance from the bus stops, as well as the Luas stop was excessive due to the size of the campus, the location of the main campus entrance, and main building entrance. With a single public entry point to the 12-hectare campus, the site boundary lacks permeability or interconnectedness with the adjacent community, thus contributing to the accessibility difficulties highlighted above.

#### **9.3.3.4 Site Design and pedestrian or vehicular facilities**

Several of the key design issues discussed in Section 3.5 are relevant to the site design of the campus including: safety; promoting independence; contact with nature; supporting orientation and wayfinding; providing space for physical activities; and others. Moreover, Section 3.6.3 examines how campus design and onsite circulation, specifically architectural quality, key external spaces, pedestrian and vehicular movement, greatly influence user experience of the hospital.

With respect to the case study hospitals, site design and pedestrian or vehicular facilities were raised as major concerns for both Naas and Tallaght; furthermore, of all the issues raised by stakeholders, the one which garnered the most negative responses was in relation to parking facilities. Across both case study sites, stakeholders stated that the site design should do more to support individuals, as well as making them feel safe and secure; specific to Tallaght, locating the carpark in such close proximity to the ED was not perceived as safe. The public car park building was raised as an issue multiple times during the

stakeholder questionnaire and structured questionnaire by patients and APs; stakeholders felt that it was difficult for drivers to manoeuvre.

A lack of disability spaces was raised by both APs, patients, and staff as an issue across the case study sites. Inadequate drop-off facilities at the entrance of the hospital were raised by APs and patients as a difficulty in both Tallaght and Naas, and, specific to Tallaght, inadequate drop-off spaces resulted in the need for multiple persons to accompany a patient to hospital (i.e. a driver to drop-off the patient at the entrance and then park, and another person to wait with the patient). The need for multiple APs contributes to the number of people who then need to enter and use the hospital; this in turn has an effect on the capacity of the hospital built environment to cater to a higher volume of people (i.e. multiple APs put more pressure on waiting rooms and other public areas).

Lack of outdoor seating throughout the campus grounds of the case study sites was noted by a number of respondents as a key issue in relation to on-site circulation. Referring back to the literature in Section 3.6.3, resting places for older people, or those with a mobility impairment is an important feature in the outdoor environment. Guidance in this regard advocates for comfortable seating, with back and arm rests, every 100m to 125m along main exterior circulation paths.

### **9.3.3.5 Entry and Reception**

With regards to entry, one of the more pressing issues arose from the Tallaght building analysis. Specifically, the stakeholder engagement process revealed that many patients do not feel comfortable or safe using revolving doors or side doors at the entrance to the hospital and point to the need for accessible and visible doors. Findings point to an issue concerning the degree to which the automatic revolving door is both easily recognized and identified as being a door.

A good reception area is also important, in terms of orientation and information and for affording a welcoming feeling for patients and their carers. The supervision provided by a reception also provides a sense of safety and calm with regards to the internal hospital environment, particularly in public spaces. The location of the reception area should be within proximity of the entrance so as to allow patients and APs to find it easily when they enter the foyer of the hospital.

The need for a good and easily recognizable reception area was also highlighted as an important element at the inpatient ward level. Specific feedback from the stakeholder workshop noted the need for a reception area to help orientate patients and APs to the ward environment; furthermore, this was viewed as distinct and serving a different function from a clear and easily identifiable nurses station.

### **9.3.3.6 Hospital Layout and Key internal spaces**

Due to the overall size of the case study hospital sites, particularly with regards to Naas and Tallaght, many stakeholders commented that the walking distances to certain parts of the hospital were excessive. As noted in the underlying issues section, hospitals can be very confusing environments for patients and their APs; this confusion can be exacerbated by a hospital layout that places heavy demands on patients and their APs, particularly those who are older, have a MCI or dementia, or have mobility issues. In the case of the OPD in Tallaght, for first-time appointments, patients and their carers must navigate to and from multiple areas in a hospital for a number of tests (bloods, x-rays, etc), each of which is located in a different part of the hospital, away from the OPD clinic. This demand to successfully navigate the hospital environment, particularly the size and layout of Tallaght, can contribute to a stressful visit for their patients and carers.

With regards to key internal areas of the hospital, a number of hospital areas in both Tallaght and Naas were identified as problematic, including inpatient wards, OPD and ED. For example, in relation to Naas, the stakeholder engagement process identified that the two-level OPD contributes to wayfinding and orientating difficulties for patients and APs as to which floor they need to be on for their appointment. In both Tallaght and Naas, patients and APs, as well as hospital staff stated that a specific pathway for older people with dedicated spaces in the ED, including for APs, would improve the experience for many people. Lastly, with respect to inpatient wards, the stakeholder engagement process in Naas highlighted the importance of day rooms on the ward, as ideal places for family members to bring a patient to sit, eat, or to have tea. However, day rooms are not evenly distributed throughout the hospital, resulting in patients staying within their bed bay area in their ward. The lack of day rooms was also raised during the stakeholder workshop exercise as a key concern, further demonstrating the importance of such spaces for patients and their families and carers, particularly as it relates to privacy and space for activities. Furthermore, the stakeholder workshop exercise noted that, where a day room is



incorporated into an inpatient ward, it would be important to consider its location carefully; a day room in a location further from the main patient areas may provide a destination point, encourage walking, and, in the case of persons with dementia, space for pacing.

On a final note, toilets, including the number and location of, as well as the need for accessible toilets was raised as an issue in this research. Toilets should to be designed with enough space to allow for a person with a frame to easily manoeuvre it and themselves into and out of the toilet; furthermore, more consideration should be given to increasing both the number of wheelchair and hoist-friendly toilets, as the lack of these types of toilets in the hospital setting is not ideal for patient dignity and comfort. Lastly, toilets should be easily recognizable and stick out so that people are able to locate them; on this point, it is well worth noting the efforts made in Naas, and the painting of door frames an accent colour in OPD and the Day Hospital, to ensure that toilets stand out.

### **9.3.3.7 Inadequate Space Provision**

Across all three case study sites, inadequate space provision was identified as an issue. Generally, staff noted that they find that the wards are too cramped and cluttered, making it difficult for staff to do their work; furthermore, more space, particularly at the bedside was viewed as beneficial, in order to accommodate visits from family members and friends. In Peamount, the stakeholder engagement process revealed the need for multi-functional spaces, including equipment serving a number of functions, in order to reduce the amount of equipment needed and make hospital spaces more flexible. Given that individual patient needs may change throughout the course of their hospital stay, and notwithstanding the fact that needs differ greatly from patient to patient, dementia friendly design should address the current lack of flexibility within patient rooms to deal with multiple patient needs over time.

Adequate space for pacing and walking is beneficial for patients, particularly for persons with dementia; the availability of space for pacing and walking was identified as an issue, both positively and negatively, across the hospital sites. For example, owing to configuration and layout of space in the AMU in Tallaght, there is no space for pacing, and this was raised as a key concern during staff interviews. On the other hand, staff in interviews in the Naas Day Hospital pointed to the fact that the 'Day Hospital planned a circular environment' for walking. That said, stakeholders in Naas raised the need for pacing space in the ED.

The need to have distinct spaces to support distinct activities (i.e. sleeping vs eating) was raised by staff in each of the case study sites. Encouraging family/APs to visit the hospital, especially during meal times. In both Tallaght and Peamount, the stakeholder engagement process noted the importance of the distinct dining space; patients recognize these spaces as one for eating and this provides the cues for patients, particularly those with dementia, to engage in activities of daily living, as well as supporting eating as a communal activity.

The findings from the stakeholder workshop aligned with those from the case study sites with regards to the lack of space; with specific reference to the ward environment, the stakeholder workshop participants noted that lack of space, particularly in the shared ward has an impact of patient privacy and dignity, as well as the ability to undertake activities at the bedside (i.e. eating, visits from family). Furthermore, lack of space has a knock-on effect on other aspect of the hospital environment, including lack of visual/spatial orientation, lack of familiar facilities, and lack of contact or views to outside/nature. Lack of outdoor spaces is further discussed below.

#### **9.3.3.8 Lack of Outdoor Spaces**

Access to outdoor space was raised in staff interviews, across multiple hospital areas, in each of the three case study sites. In Tallaght the issue is two-fold; firstly, certain areas of the hospital lack access to an outdoor space (i.e. AMU and OPD – in both instances, staff noted the need for access to an outdoor space as this would be beneficial for patients), and secondly, where a garden space is available, as is the case in the Charlie O’Toole Day Hospital, safety issues and lack of lighting have resulted in this space being inaccessible to patients. By contrast, the stakeholder engagement in Naas reported that their enclosed garden space is well-used by Day Hospital patients, particularly when it is sunny. This garden space is also easily accessible by one of the inpatient wards; however, security/safety concerns resulted in the space being underused by patients from that ward. Even in instances where security and safety are not an issue, the stakeholder engagement process, particularly about Peamount and Naas-OPD revealed that garden/outdoor spaces are not being used/are under used by patients. On a final note, the ad hoc stakeholder engagement process shed light on the importance of outdoor spaces as therapeutic and calming spaces, particularly for a person with dementia. Safe and secure access to outdoor spaces and gardens allow a person with dementia the opportunity to ‘decompress’ and orientate themselves to ‘their next appointment’.

As noted in the literature review, the provision of external spaces directly accessible and usable by patients, family and staff is an important therapeutic component of a hospital. The need to apply a dementia friendly design approach in the creation of outdoor spaces, reflects and take into account the needs of patients with dementia; furthermore, the presence of such spaces in a hospital setting can also function as a place for respite for family members, and patients, as well as staff, offering up a quiet and calming space. This latter point highlights another finding of the research, which is further discussed in Section 9.4, namely the leveraging of synergies across various hospital improvement initiatives.

### **9.3.3.9 Lack of Supports for persons with disabilities**

Lack of disability parking spaces was raised an issue across all three case study sites. Within the hospital, sit down areas, resting spots and handrails on corridors were all identified as important supports for patients. Staff interviews highlighted the need for sit down areas, resting spots and handrails on corridors within the hospital for those with limited mobility. Specific to Tallaght hospital, given its size and campus layout, the stakeholder engagement process noted that the presence of sit down and rest spots would be beneficial, as patients can sometimes be required to walk a fair distance, under reduced mobility conditions; this is especially true if they have arrived by car and parked in the carpark building.

In terms of wheelchair provision, the stakeholder engagement process in both Naas and Tallaght highlighted a particular frustration among patients and APs with respect to the difficulty of locating and securing a wheelchair once inside the hospital. In one instance, an AP noted that the difficulty associated with securing a wheelchair when they are in Tallaght for an appoint results in the need for more than one family member/carer to accompany a patient to the hospital.

### **9.3.3.10 Interior Design**

Across all three case hospital sites, the stakeholder engagement process revealed that many patients and family members rated the interior design of hospital favourably; in contrast, many staff members believed it was drab, too clinical, and monotonous. The discrepancy between patients and APs and staff perceptions with regards to their impressions of the interior design of spaces points to the subjective nature of these things. When pushed on the subject interior design, many patients and family members responded with “what would

you expect it's a hospital", which may indicate that patients and APs have low expectations of the physical hospital environment.

With regards to internal design in relation to the inpatient ward environment, the stakeholder workshop exercise revealed that lack of art was an issue. Careful curation, i.e. the need for curation of art and visual art/technology in the hospital environment not only contributes to a more attractive interior, it can also ensure clutter free environment, and provide a means to facilitate wayfinding and orientation for patients and their family/carers. When considering artwork vis-à-vis interior design, it is also important to take into account its suitability for patients; this is not to say that art should not provoke, but rather, curation should consider what is familiar to patients and family members with respect to local context.

### **9.3.3.11 Key Building Components**

Overall, while chairs were generally rated favourably in terms of availability and comfort, comments from respondents across all three hospital sites, particularly in Naas and Tallaght, highlight a number of issues on both fronts. As noted in the thematic analysis in Chapter 7, the ebb and flow associated with the age-related health outpatients clinic in OPD in Tallaght Hospital can result in a lack of available chairs in the waiting area, due to the volume of individuals in the space during a busy clinic; in addition, respondents in both OPD (Tallaght) and ED (Tallaght and Naas) noted that long wait times has an impact on their comfort levels.

In addition, in Tallaght the location of the handwashing stations in the reception area of the hospital was noted as an obstacle, and created a blockage of movement for individuals moving through the main entrance (i.e. too close to the main doors).

### **9.3.3.12 Lighting**

Across the case study sites, findings generally noted that lighting can be poor, and in some cases, as a result of low lighting levels, further perceived as dull. On the other hand, high levels of lighting was noted by patients as an issue, especially at night. Keeping the lighting turned on during the night is an issue for persons with dementia as it has an impact on their ability to distinguish different times of day, and the activities associated with day-time light (awake, active) and night-time light (sleeping).

Feedback from the stakeholder workshop noted poor lighting on the ward, particularly in the form of excessive contrast and inadequate illumination. This is compounded by glare and excessive reflectance from floor surfaces.

Findings suggest a need for balance in terms of lighting that takes account of visibility and visual access, but also acknowledges the need for orientation expressed through different lighting levels within the hospital. As it relates to the stakeholder workshop feedback, suggestions to ameliorate issues around lighting at the ward level included a layered lighting strategy, solar control, and better artificial lighting control.

## **10 Barriers and Facilitators to Implementing Environmental changes or New Design Approaches**

### **10.1.1 Barriers**

A number of challenges to implementing a dementia friendly design approach were identified from the stakeholder engagement process, and outlined in Section 3.6.10. These included:

#### **9.4.1.1 The complexity of the hospital environment**

As highlighted at the onset of this research report, hospitals are challenging environments. Diverse stakeholders, multiple hospital services, various strategies, standards, and regulations, along with complicated procurement policy, all combine to create a complex environment where real and perceived obstacles can hinder change. To compound this, the international case studies illustrate that many acute hospitals are becoming larger, this is something that must be carefully managed if key dementia friendly issues such as people centred environments, balancing sensory stimulation, or supporting orientation and navigation are to be incorporated.

#### **9.4.1.2 Physical Constraints of existing building**

Physical characteristics of the existing hospital combined with the inherent inflexibility of most construction (i.e. heavyweight materials, structural issues, building services etc.), constrains many potential environmental changes.



#### **9.4.1.3 Cost**

Due to typical construction methods involving heavyweight materials and structures, building is often a costly process. This is compounded by the high costs typically associated with hospital construction.

#### **9.4.1.4 Disruption**

Disruption to patient care is a significant obstacle to carrying out building works in a hospital due to operational pressures and increasing numbers and patient flow.

#### **9.4.1.5 Initiative or Improvement Fatigue**

Constant service improvement concurrent initiatives to improve patient care can lead to 'initiative fatigue' or 'quality improvement overload' where management or patient-facing staff are less willing and able to implement changes.

#### **9.4.1.6 Challenges around Staffing Levels**

As noted in the research, provision of outdoor spaces, day rooms, and activity rooms, has been highlighted as an element of dementia-friendly design, in so much that these spaces contribute to an environment that enables physical, social, and activities for daily living for people with dementia; however, this in turn places pressure on the hospital with respect to ensure adequate staffing levels. Difficulties with respect to existing staff shortages and staff recruitment, as well as restrictions related to cost, can be a barrier to the effective implementation of a dementia-friendly approach in the hospital setting.

#### **9.4.1.7 Attitudinal or cultural barriers**

Change is often simply impeded by attitudes and cultural issues. While some physical alterations may not be that expensive or disruptive, they may be opposed due to a lack of consensus or people's resistance to change. Furthermore, changes to the physical environment (to make them more dementia-friendly) notwithstanding, it is important to note that people with dementia will usually come into contact with a wide range of staff in acute settings. As noted in the National Dementia Strategy 'a good awareness of dementia and appropriate skills for dealing with dementia is therefore extremely important for all those who deal with people with dementia in acute hospitals'. On this latter point, staff

knowledge and enthusiasm has been identified as a facilitator in promoting a dementia-friendly approach, and is further discussed in following section.

## 9.4.2 Facilitators

Notwithstanding the above barriers there are a number of indirect and direct facilitators that may help to support a dementia friendly design approach including:

### 9.4.2.1 Positive Societal and Policy Developments regarding Ageing and Dementia

Changing population demographics necessitate a change in perspective in how we view the ageing process, generally, and healthy ageing specifically. Positive societal and policy developments regarding ageing and dementia contribute to creating the conditions to support good health for older persons; specifically, strategies which promote and support a positive ageing process (such as the National Positive Ageing Strategy), and a greater awareness of dementia (including understanding of dementia as a disability, as outlined in the National Dementia Strategy), can act as facilitators in the implementation of dementia-friendly design, insofar as they support the engendering of greater understanding and change of mind-set with regards to ageing and dementia at a broader societal and policy level. Furthermore, the extent to which these, and other strategies recognize the role of the built environment in supporting positive health outcomes in relation to ageing and dementia – for example the National Dementia Strategy has a section on Acute Care, and notes that hospital should be dementia-friendly from admission to discharge/death – should not be overlooked.

### 9.4.2.2 Growth of Patient-Centred Healthcare

One of the key findings from this research notes the importance of adopting a patient-centred approach, particularly as it relates to with respect to promoting positive health outcomes for individuals. As noted in the literature, the experience of dementia is not the same for all individuals; each person diagnosed with dementia will have his or her own experience, including how they perceive themselves in relation to their diagnosis. By focussing on the individual, patient-centred care acknowledges the patient as a ‘unique living being, and the obligation to care for them on their own terms’, and in so doing, it aligns itself with many of the design principles espoused by dementia friendly design, namely patient and family-friendly issues, the provisions of a people-friendly environment, and the provision of adequate space to support the specific needs of a person with dementia.

The international case studies demonstrate strong patient-centred design principles that have clearly moved hospital design on from process-driven thinking that was more apparent in the recent past. In addition to patient focus, the case studies also reveal a people-centre approach to create a more supportive and humane environment for all users. In the case study hospitals this results in a softer less institutional environment that is integrated with the local context and more welcoming to the community.

The growth of patient-centred health care, and the ways in which it enables and reinforces patient empowerment should be viewed as a key facilitator in the context of supporting dementia friendly design.

#### **9.4.2.3 Increasing focus on healthful and health-promoting design.**

The findings from this research identify growing consideration about the impact of the built environment on human health and wellbeing. This shows an evolution beyond mitigating the negative effects of the hospital environment, towards a more active healthful and a health-promoting approach, aligning with a salutogenic design philosophy.

In this regard, the international case studies promote active healthful design, aligning with a salutogenic approach. Rather than a pathogenic approach that focuses on what makes people ill, a salutogenic approach focuses on what makes people healthy. Bearing in mind that a sense of coherence, which is underpinned by ‘meaningfulness’, ‘manageability’, and ‘comprehensibility’, is at the core of salutogenics (Becker et al., 2010), it is interesting to see how many of the case study hospitals have worked hard to create locally responsive and meaningful environments that are supportive of user’s needs, and strive to enhance legibility and orientation in what is often a complex environment.

The international case studies also illustrate that the integration of landscape and outdoor space through courtyards and fingers of landscape that project into the hospital is becoming increasingly important in acute hospital design. This helps to break down the mass and negative impact of large institutional buildings, allows for natural light and ventilation to penetrate deep into the building plan, and provides accessible and safe place for patients and visitors to step outside and gain respite from clinical, institutional environments. Integration of outdoor space can help to provide meaningful views to the outside from a range of patient areas and greatly support orientation and navigation

In addition, the integration of nature and biophilic design further enhances the healthful, positive and people friendly qualities of many new hospital designs. Nature and landscaping provides a strong counterpoint to the more sterile, clinical nature of spaces which are often appropriate in the acute hospital setting. Landscaping can offer visual respite and meaningful views from clinical zones, and accessible landscaped areas can help patient re-establish a sense of balance through contact with the outdoors and the elements.

These developments pay more attention to the biopsychosocial needs of all users and will in turn reap benefits for dementia friendly design if they result in a more sensitive, responsive, and inclusive hospital environment.

#### **9.4.2.4 Convergence between dementia friendly design and best practice contemporary hospital design.**

Taking into account the issues discussed in 9.4.2.2 and 9.4.2.3 above, the international case studies presented in Chapter 6 illustrate how dementia friendly design naturally aligns with the people-centred and patient-centred design demonstrated in contemporary best practice. Furthermore, it can be argued that if the few dementia related weaknesses identified in the exemplars were strengthened, it would improve the overall performance of the hospital for all users. This is a very encouraging finding as it shows that there is little divergence and that dementia friendly design can contribute to a positive experience for all users.

#### **9.4.2.5 Greater Awareness and Understanding about the Impact of the Built Environment**

Despite results from the thematic analysis which show a clear difference between patients and carers and staff members in awareness and understanding regarding the impact of the hospital environment, the literature recognizes the role of the physical environment in human health and well-being; furthermore, the value and role of Universal Design vis-à-vis the built and environment and health and well-being is keenly understood and respected in Ireland, as demonstrated by the fact that Universal Design is enshrined in the legislation. In this regard, the mainstreaming of design for well-being, age friendly design and dementia friendly design generally, will help to promote and support dementia design in hospitals.

#### **9.4.2.6 Universal Design and Dementia Friendly Design**

Universal Design, due to the inclusive and participatory nature of its approach, provides an ideal framework for dementia friendly design. By placing the individual at the centre of the

design process, it ensures that the concerns, inputs and needs of that individual are reflected in the final outcome/product. If carefully implemented in hospitals, a dementia friendly design approach, underpinned by Universal Design principles, can benefit not only a person with dementia, but also all staff and visitors of various ages, sizes, abilities and disabilities.

Universal Design and Dementia Friendly Design are mutually reinforcing, and the hospital environment provides an ideal context within which to highlight the ways in which these two design processes contribute to the promoting good health outcomes across the life-span, including further strengthening the policy and mind-shift with respect to positive ageing.

#### **9.4.2.7 Staff Knowledge and Enthusiasm**

A key finding to come out of the thematic analysis is the high level of staff knowledge with regards to dementia, and the role of the physical hospital environment in exacerbating and/or alleviating the symptoms of dementia. In addition, the value of training for staff in the area of dementia was highlighted as a priority, given the importance of the staff-patient relationship in the delivery of care, and the promotion of good health outcomes. Including staff as catalysts in all aspects of dementia friendly design can facilitate not only ease of implementation of a dementia-friendly approach, but it can also act as a counter-measure to the attitudinal or cultural elements present in the hospital environment, elements which have been previously been identified as barriers.

#### **9.4.2.8 Capitalising on synergies between various hospital improvement initiatives**

As noted previously, hospitals are complex and challenging environments, something which, in simple terms, the implementation of hospital improvement initiatives seek to address. It is important to take stock of where the key synergies between a dementia friendly design approach and these initiatives lie, and where appropriate, to exploit or capitalize on them for the benefit of patients and families, staff, and visitors. The obvious benefits in relation to promoting health and well-being notwithstanding, capitalizing on the synergies between a dementia friendly approach and, for example, the Productive Ward, could also address and counter the effects impacts of costs, and staffing levels, highlighted herein as barriers, and in so doing, these synergies can serve to further bolster the dementia friendly hospital approach.



## 9.5 Conclusion

On the one-hand this research confirms the negative impact of the acute hospital setting on many patients with dementia, However, on the other hand it illustrates the positivity and expertise that exists in a typical hospital around the needs of people with dementia, and demonstrates a genuine willingness to improve the physical environment in this regard.

It also reveals that while participatory design is a central component of a patient-centred and family friendly approach, there are real challenges around co-designing and participation for people with dementia, partly due the symptoms of dementia, but also related to family/ carer input.

The research shows that there are many evidence based design features and well supported design guidelines to support dementia friendly hospital design. From the literature, this research identifies 18 Key Dementia Friendly Design Issues spread across seven main themes including: A) supporting engagement and participation; B) providing a people-centred environment; C) design to balance sensory stimulation; D) supporting orientation and navigation; E) providing adequate space to support the specific needs of a person with dementia; and, finally F) the appropriate use of technology. These design issues apply across all spatial scales within the hospital, from the location of the hospital down to individual building components.

Some of these issues, for example balancing sensory stimulation or orientation are well covered in the literature, others however, such as how people with dementia are impacted by hospital location or levels of hospital-community integration, is not well examined and requires further research. Notwithstanding this lack of evidence, this report briefly examines some of these issues and others such as the design of hospital campus grounds or the overall architectural quality of a hospital, and argues that these issues must be carefully considered if an integrated dementia friendly approach is to be achieved across all spatial scales.

Further to these design issues, the research identifies some key potential barriers to implementing dementia friendly design in hospitals, but more importantly it points to many positive developments, initiatives, and conditions that if properly harnessed, could support

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changes towards a more dementia friendly environment in hospitals, and in turn help them to fulfil their role as caregiving and healing facilities.

The research shows how significant improvements can be made to existing hospitals. Many of the projects described in this research were carried out in existing and active hospitals, and therefore it is encouraging to see that improvements are possible for people in terms of dementia, and that at the same time raise the standard of the physical environment for many hospital users.

In the context of new-build hospitals, the research demonstrates a shift towards more people centered and healthful hospital design in general. In this regard, there is a clear convergence between a dementia friendly approach and general best practice contemporary hospital design, an encouraging finding that illustrates how dementia based research can contribute to the developing knowledge base and evidence around good hospital design.

Finally, it has been shown that a dementia friendly design approach can result in improved care outcomes such as reduced length of stay or the reduction in patient slips and falls. Furthermore, the positive feedback from patients, family members and staff who have experienced dementia friendly environments reinforces that dementia friendly design benefits not only people with dementia or a cognitive impairment, but also a wide range of patients, visitors and staff of all ages, sizes, abilities and disabilities.

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## **II Appendices**

### **8.1 Appendix A – Steering Committee**

Professor Desmond O’Neill - Principal Investigator – Tallaght Hospital and TCD.

Tom Grey - TrinityHaus, TCD.

Dimitra Xidou - TrinityHaus, TCD

Dr. Sean Kennelly - Tallaght Hospital.

Mary Hickey - Rose Cottage, Alzheimer’s Society of Ireland.

Seamus Cunningham - Irish Dementia Working Group.

Dr. Ger Craddock - CEUD/NDA.

Neil Murphy MRAI - CEUD/NDA

Paul de Freine - HSB Estates, HSE.

Anna de Siún – NDO.

Sean Mahon MRAI - O’Connell Mahon Architects.

Victoria Mannion - O’Connell Mahon Architects.

Matthew Gibb - DSIDC, St. James’s Hospital.

Susan O’Reilly - Connolly Hospital Blanchardstown.

Anne O’Hea - Mercy University Hospital Cork (MUH)

Áine Coe - Naas General Hospital.

Cathy McHale - Tallaght Hospital.

Eimear Digan - Tallaght Hospital.

Susan Lawson - Tallaght Hospital.

Gillian Harte - Tallaght Hospital.

## 8.2 Appendix B – Questionnaire

### Questions

<b>1. General information</b>
<b>A. Age:</b>
<b>B. Gender:</b> Female <input type="checkbox"/> Male <input type="checkbox"/>
<b>B. Living arrangements:</b> Living on your own at home <input type="checkbox"/> Living at home with family or others <input type="checkbox"/> Living with family in a family members home <input type="checkbox"/> Living in a care home or other long stay residential accommodation <input type="checkbox"/>
<b>C. Where approximately do you live in relation to the hospital?</b> Within one or two miles <input type="checkbox"/> Within five miles <input type="checkbox"/> Within ten miles <input type="checkbox"/> Further than 10 miles <input type="checkbox"/>
<b>D. How do you usually travel to the hospital?</b> Walk <input type="checkbox"/> Cycle <input type="checkbox"/> Car <input type="checkbox"/> Taxi <input type="checkbox"/> Bus <input type="checkbox"/> Luas <input type="checkbox"/>
<b>E. When visiting the hospital, do you ever require a wheelchair?</b> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Never <input type="checkbox"/>
<b>F. Any other comments</b>

<b>2. Visits to the hospital</b>
<b>A. What have your main reasons been for visiting the hospital? (can be more than one)</b> As a patient or outpatient myself <input type="checkbox"/> Accompanying a patient to an appointment or visit <input type="checkbox"/> Visiting a patient <input type="checkbox"/>
<b>B. If you attend as a patient or accompanying a patient which of the below would best describe the purpose of your last visit?</b> Outpatient- memory related <input type="checkbox"/> Outpatient- non- memory related <input type="checkbox"/> Emergency or acute medical unit <input type="checkbox"/> Day hospital <input type="checkbox"/> Specialist geriatric /General ward <input type="checkbox"/>

<p><b>C. How often would you visit the hospital in total?</b> (include all visits as per B above)</p> <p>Less than once a year <input type="checkbox"/></p> <p>Two or three times a year <input type="checkbox"/></p> <p>Once every two to three months <input type="checkbox"/></p> <p>Once a month <input type="checkbox"/></p> <p>More frequently than above <input type="checkbox"/></p>
<p><b>D. If you visit as a patient, do you go alone or do you go with someone else?</b></p> <p>Usually by myself <input type="checkbox"/></p> <p>Sometimes by myself and sometimes with someone else <input type="checkbox"/></p> <p>Typically, with someone else <input type="checkbox"/></p> <p>Not applicable <input type="checkbox"/></p>
<p><b>E. If you go with someone else, is it usually the same person?</b></p> <p>Usually the same person <input type="checkbox"/></p> <p>There are a few different people that come with me so it's usually one of those <input type="checkbox"/></p> <p>Usually it's a different person each time <input type="checkbox"/></p> <p>Not applicable <input type="checkbox"/></p>
<p><b>F. Any other comments</b></p>

<b>3. Site location, approach and entry</b>	<b>bad</b>	<b>OK</b>	<b>good</b>	<b>No opinion</b>
<b>A. How do you rate the hospital's location in terms of access from your home?</b>				
<b>B. How comfortable, pleasant and/or safe are the streets or areas directly outside the hospital grounds?</b>				
<b>C. How good is the access to the main entrance to the hospital grounds when walking?</b>				
<b>D. How good is access when arriving by LUAS?</b>				
<b>E. How good is access arriving by bus?</b>				
<b>F. How good is access arriving by car?</b>				
<b>Do you have any other comments with respect to site location, approach and entry?</b>				

<b>4. Moving around on the grounds of the hospital</b>	bad	OK	good	No opinion
A. How easy is it to find your way around the hospital grounds?				
B. Overall how do you find the hospital grounds in terms of being calm or easily understood?				
C. How good are the paths in terms of comfort and safety?				
D. How good is the external lighting in terms of comfort and safety?				
E. What do you think about the provision of seating or resting spaces on the hospital grounds?				
F. If you arrive by car what do you think about the parking facilities at the hospital?				
G. How convenient is it to get from the car to the hospital entrance?				
Do you have any additional comments regarding moving around the grounds of the hospital?				

<b>5. Going into the hospital and finding your way around inside</b>	bad	OK	good	No opinion
A. How do you rate the hospital entrance in terms of it being easy for people to find?				
B. How easy is it to use the main entrance doors? Are they good in terms of opening or going through them?				
C. Once inside what is your experience of finding your way around or locating certain places or things you need?				
D. Overall how do you find the hospital interior in terms of being calm and easily understood?				
Do you have any additional comments regarding going into the hospital and finding your way around inside?				



<b>6. The main spaces and rooms within the hospital</b>	<b>bad</b>	<b>OK</b>	<b>good</b>	<b>No opinion</b>
A. How would you rate the main entrance and reception area in terms of being pleasant, easily used and easily understood?				
B. How well do the café and main waiting areas work in terms of providing nice places to wait, rest, or have some tea or coffee?				
C. How would you rate the toilets in terms of availability and location?				
D. How would you rate the toilets in terms of being easy to use and understand?				
E. How would you rate the other rooms you might use during your visit?				
Do you have any additional comments regarding the main spaces and rooms within the hospital?				

<b>7. Furniture, signs, decor, technology and other details</b>	<b>bad</b>	<b>OK</b>	<b>good</b>	<b>No opinion</b>
A. Is the provision of seating throughout the hospital good enough?				
B. How comfortable is the seating?				
C. How would you rate the signs in terms of helping you to find your way around?				
D. How would you rate the décor in the hospital in terms of creating a calm and pleasant environment?				
E. How would you rate the décor in terms of making the hospital environment easy to understand?				
F. What do you think about public announcement system? Can you hear or do you find it noisy or distracting?				
G. What do you think about the TVs in the waiting areas?				
H. If you (or someone you are with) require a wheelchair, how do you rate the availability of wheelchairs during your hospital visit?				
I. If you (or someone you are with) require a wheelchair, how easy it to find a wheelchair once inside the hospital?				

Do you have any additional comments regarding furniture, signs, décor, technology and other details?

<b>8. Internal Environment</b>	bad	OK	good	No opinion
A. Is the hospital comfortable in terms of heating?				
B. How would you rate the hospital in terms of fresh air or ventilation?				
C. How would you rate the hospital in terms of lighting?				
D. In terms of noise what do you think?				
E. In terms of smells within the hospital, do you think it is a pleasant environment?				
F. Overall, when you think about lighting, noise etc., how good is the hospital overall in terms of creating a pleasant and calm environment?				
Do you have any other comments regarding the internal hospital environment?				

<b>9. Overall Experience</b>	bad	OK	good	No opinion
G. Overall, how would you rate your visit(s) to the hospital?				
H. Overall, how would do rate the hospital with respect to supporting the person who accompanies you on your visits?				
I. Overall, how would you rate the hospital as it relates to your role as a carer?				

**10. Any other thoughts or feedback?**

## 8.3 Appendix C – Semi-Structured Interview Template I

### INTERVIEW TEMPLATE – DEMENTIA FRIENDLY HOSPITALS – STAFF INTERVIEWS

STAFF:

AREA OF HOSPITAL:

Q1: Overall Questions	
What is the average number of patients that visit the area you work in on any given day?	
What is the average number of medical staff (consultants, nurses, others) in the area you work in?	

Q2: Give an example of an older person coming to the area of the hospital that you work in, who might have memory problems, a MCI, or dementia	
Age/Gender	
Physical health	
Mental Health	
Reason for being at Hospital (in the Unit/area you work in)	
How do they end up in the Unit/area you work in	
Are they accompanied (if so, by whom)	
Would they be living at home, with a spouse, alone, in a care home, etc	
Would they be a return patient? (Note – this question relates to a person’s familiarity with the environment)	
What are the rates of DNA	
What are the reasons	

<b>From a care provision perspective, what would you consider a good patient outcome with respect to their visit</b>	
<b>As above, what would you consider as a good outcome for the carer</b>	

<b>Q3: What might the patient's (and carer's) physical journey be to get to the area of the Hospital that you work in?</b>	
<b>Would the patient be coming from some other part of the hospital?</b>	
<b>Would they be coming from home?</b>	
<b>How might they travel to the hospital?</b>	
<b>What other part of the hospital might they come through to get to the area you work in?</b>	

<b>Q4 – Once they arrive in your area/unit what happens?</b>	
<b>What do they do/Where do they go/how long do they stay there</b>	
<b>Do they leave the unit/area during their stay to go to another part of the hospital for any reason – casual coming and going?</b>	
<b>If they leave, are they accompanied (by whom, carer, nurse, both)</b>	
<b>How easy it for patients to locate the things that they need (i.e. toilets, finding their way back to the clinic, etc.?) Is signage adequate?</b>	

<b>Q5. Once they leave, what might their journey be:</b>

<b>Q6. Having considered the above, what is your opinion about the physical environment of the hospital and how it supports people who have memory problems, a MCI, or dementia?</b>	
<b>Problems – e.g., is the environment agitating, disorienting, stressful in any way for patients:</b>	
<b>Opportunities/Recommendations</b>	
<b>Suggest a few measurable outcomes that would reflect the performance of the environment</b>	



## 8.4 Appendix D – Semi-Structured Interview Template II

### INTERVIEW TEMPLATE – DEMENTIA FRIENDLY HOSPITALS – ADMIN/MANAGEMENT STAFF INTERVIEWS

STAFF:

AREA OF HOSPITAL:

<b>Q1: What is the role of the hospital?</b>
<b>Q2: In your opinion, what are the key elements of the physical environment that are required to support people with dementia?</b>
<b>Q3: In addition, how can the physical environment support the accompanying person in their capacity as a carer?</b>
<b>Q4: In your opinion, what, if any, are some problems with regards to the hospital environment (i.e. is the environment agitating, disorientating, stressful in any way for patients)?</b>
<b>Q5: What are the barriers to implementing change from an organisational perspective?</b>
<b>Q6: Following on from above, what are the existing opportunities within the hospital that can be used to leverage change and promote a dementia-friendly environment?</b>

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