

Homes for people with dementia and sight loss

A guide to designing and providing safe and accessible environments

Principal author, Antonia John, RNIB Cymru

RNIB
Cymru

supporting blind and partially sighted people



Homes for people with dementia and sight loss

A guide to designing and providing safe
and accessible environments

Principal author, Antonia John, RNIB Cymru



Front cover photograph by kind permission of Linc Cymru

© RNIB 2014

RNIB registered charity number 226227

RNIB

No matter at what stage of life or how long individuals have been experiencing problems with their sight, living with sight loss can be challenging. The Royal National Institute of Blind People (RNIB) provides support, advice and products to help people living with sight loss to remain independent. Whether you want to know more about eye conditions, buy a product or publication from our shop, join our library or talking book service, find out about possible benefit entitlements, be put in touch with a trained counsellor, or make a general enquiry about living with sight loss, we're only a call away.

For information and support, call **0303 123 9999** or email **helpline@rnib.org.uk**

RNIB Cymru – consultancy, training, accreditation and research

RNIB Cymru's vision is to have housing and buildings in Wales that are inclusively designed and accessible for all. Our aim is to help ensure that all people, including those who are blind and partially sighted can access the built environment safely and independently. In order to meet this vision our Supporting Independent Living team carries out access consultancy, training, research and accreditation.

We are a not for profit consultancy service who offer a pan disability approach to assessing and auditing the built environment. The service has been involved in several unique projects including the development of Extra Care Homes, Community Centres, NHS buildings, Care homes for people with dementia and learning disabilities and refurbishing sheltered housing.

Visibly Better Cymru Accreditation

Our “**Visibly Better Cymru**” accreditation system can provide housing and care home providers with a structure for development and help you promote your success to your tenants and partners.

Training

Our training courses equip people with the knowledge and skills to improve their buildings and services to older people and people with sight loss.

Research

Our continuing research seeks to ensure that the needs of those with sight loss are met.

For further information please contact visiblybettercymru@rnib.org.uk

Supporting organisations

Alzheimer's Society

Alzheimer's Society is the UK's leading support services and research charity for people with dementia and those who care for them. The Society provides information and support for people with all forms of dementia and those who care for them through its publications, dementia helplines and local services. It runs quality care services, funds research, advises professionals and campaigns for improved health and social care and greater public awareness and understanding of dementia.

Linc-Cymru

Linc Care, the health and social care division of Linc Cymru Housing Association provides housing, nursing, care and support services for primarily older and vulnerable people. It values the commitment and support of partner agencies in promoting choice and independence, culminating in its extra care schemes receiving the RNIB's prestigious "Platinum Visibly Better Award" in 2012.

From feedback received from tenants and key partners and with ongoing assistance from RNIB and Alzheimer's Society, Linc has improved the design of its schemes such as defining colour contrast, signage, minimising reflective surfaces and confusing shadows. It has also changed other features in their schemes based on tenants' feedback. This is important as it has helped Linc design and shape future services based on need rather than demand.

They have placed more importance on gardens with sensory stimulating plants and “way finding” pathways. Telecare overlay has been included in the building fabric to allow specialist equipment to be installed easily to assist people to live independently. In addition to this they have designed special accommodation for tenants with dementia. This includes enclosed sensory gardens and subtle measures to ensure safety. They have developed respite services for people in the community in an extra care setting and established day services in some of their schemes. Linc staff have also completed “Champions in Dementia” training and “RNIB Visibly Better” training with RNIB and Alzheimer’s Society.

Hafod Care Housing Association

Hafod Care is a registered charitable housing association. It is a part of Hendre Group along with Hafod Housing Association. Set up in 1998 to develop wider care and support in the Group, Hafod Care Association provides a range of services to vulnerable people across South Wales including adults and older people with sight loss and dementia. Their services include registered nursing, residential care and adult complex care services, non-registered supported accommodation, supporting people services, both generic and dementia day services, and a registered Extra Care scheme based and community based domiciliary care. More recently Hafod Care has been working in partnership with other housing associations to provide management services in Extra Care accommodation and has developed, and manages, extra accommodation in its own right, with further schemes in build and planning.

Hafod Care sees the provision of care and support for people as a logical extension of its commitment to meeting the accommodation, health and wellbeing needs of people in South Wales. Currently working in eight local authority areas and across four health boards, Hafod Care Association was set up to manage and develop such provision.

Hafod Care is focused on delivering services that promote and support the health, wellbeing and independence of the people they work with. The organisation has been particularly keen to use the research of others to enhance the quality of life, independence and safety through design, in the development of their care homes, Extra Care schemes and supported accommodation.

Foreword

One in five people aged 75 and over are living with sight loss and over 44,500 people are living with dementia in Wales. With increasing numbers of people living longer, the numbers of people living with both sight loss and dementia are set to increase significantly in the coming years.

By ensuring that our communities are safe, welcoming and accessible to people with sight loss and dementia we can help to ensure that people can live comfortably and with as much independence as possible. The changes that are needed to make accommodation accessible are often quite simple and easy to implement, but can make a huge difference to a person's quality of life.

This good practice guidance provides practical advice for all housing providers to ensure that accommodation will meet the needs of older people, both now and in the future. This is vital to ensure that older people can stay safe and maintain their independence, but more than that, have the best possible quality of life.



Sarah Rochira

Older People's Commissioner for Wales



Foreword

I very much welcome the publication of this excellent guidance by RNIB Cymru.

Dementia is an increasingly common disability in older people and there are around 35,000 people in Wales who have it. In addition over 1 in 3 people with dementia will have a significant sight loss, with a large proportion of the rest having deteriorating vision through ageing.

RNIB Cymru have led the way in preparing this first formal guidance linking dementia with sight loss and the implications these conditions can have in the design and management of caring places.

Homes for people with dementia and sight loss provides important guidance in the design of any care facility. It is crucial for people to maintain independence as they get older, enabling them to retain their dignity and independence in carrying out everyday activities. This is a key theme throughout the guide. It links both the issues in design of new accommodation with the use and management of the accommodation. This ensures that the facilities and accommodation are both effective and efficiently provided.

I am delighted to recommend it to you.



Carl Sargeant

**Minister for Housing and Regeneration
Welsh Government**



Contents

Acknowledgements	9
Section 1 Introduction	11
1.1 Preparation of this guide	11
1.2 Background	12
1.3 Objective	13
1.4 Who is this guide for?	14
1.5 Standards, regulation, policy, guidance and the Equality Act.	14
Section 2 Dementia and sight loss	20
2.1 Sight loss and common eye conditions	20
2.2 Dementia	24
2.3 Dementia and sight loss	26
2.4 Additional consideration	35
Section 3 Design guidance	38
3.1 Lighting: natural light, glare, reflections and shadows	39
3.2 Lighting: an inclusive lighting system	49
3.3 Colour: using contrast	65
3.4 Colour: creating schemes	88
3.5 Surfaces	96
3.6 The “seeing is believing” concept	103
3.7 Acoustics	106
3.8 Wayfinding	112
3.9 Signage: a key part of a way finding strategy	124
3.10 Distinctive rooms/areas for activities	132
3.11 Handrails and rest areas along routes	136
3.12 Products and controls	140
3.13 Assistive technology	150
3.14 Accessible gardens and external areas	153
3.15 The provision of dementia wards	157
Section 4 Management, staff awareness and care plans	159
Bibliography	166

Acknowledgements

We would like to take this opportunity to acknowledge the help and encouragement provided by many people, and to thank them for their support and time. Without their input this project would not have been possible. Apologies to anyone we may have inadvertently omitted.

Principal author

Antonia John BSc Hons, MSc.

RNIB Cymru

Project management group

Joanne Lawson, RNIB Cymru

Ansley Workman, RNIB Cymru

Andrew Derrick and David Lewis, Hafod Care Housing Association

David Chinnick, Linc-Cymru

Sue Phelps, Alzheimer's Society

Editing group

Caroline Lewis and Carol Thomas, Access Design Solutions UK Ltd

Review group

Amanda Protheroe, Cardiff Metropolitan University

Dr Anna McGee, Sense

Patrick Myall, Welsh Government

Stephen Wey, York St John University

Robert Avery, York St John University

Mark Rose, MK Design Ltd

Dr. Lynn Watson, Thomas Pocklington Trust

Dr. Catherine Dennison, Thomas Pocklington Trust

Tom Murphy, Bailey Partnership

Jeremy Mears, Bailey Partnership

Dr Mark Bevan, University of York

Focus group members

Many thanks to all the focus group members and employees of the Alzheimer's Society who took part and provided support with the research. We could not have done it without you!

Other acknowledgements

Robert Saggars, RNIB
Andrew Holland, Alzheimer's Society
Nigel Sinnet, Pembrokeshire Housing Association
Jane Pagler, Community Housing Cymru
Elizabeth Burton, Warwick University
Colin King, Building Research Establishment
Colin Blick, Welsh Government
Charlotte Hardy, BRE Global Ltd
Marilyn Sturgeon, NCS UK Ltd

We would like to thank Thomas Pocklington Trust for their permission to extract text from:

Lighting Solutions guide

Improve the lighting in your home
(RNIB in partnership with Thomas Pocklington Trust, 2013)

Section 1 – Introduction

1.1 Preparation of this guide

The aim of this guidance is to support organisations and individuals when designing, refurbishing and maintaining new and existing homes. It is based on the principles of providing a fully inclusive environment that supports people with dementia and sight loss to live as independently and safely as possible.

“Homes for people with dementia and sight loss” is based on current regulations, guidelines and good practice. An extensive literature informs this publication.

The publication has been further informed by research gained from:

- specialists in the fields of dementia, sight loss and housing design
- housing associations and local authorities who provide housing for older people including Extra Care housing, care homes with EMI (Elderly Mentally Ill) wings and sheltered housing
- technical staff and development staff from housing associations and local authorities
- support staff and carers
- people with dementia and sight loss
- relatives of people with dementia and sight loss.

To gain a Wales-wide view, focus group members and individuals have been interviewed from across Wales from both urban and rural areas. Without the support of the focus group members and individuals this research would not have been possible. They supported our thoughts on many issues; provided us with a rich insight into what it is like to have both sight loss and dementia; and confirmed how vital the built environment can be in supporting the independence and safety of people with dementia and sight loss.

1.2 Background

The main objective of RNIB Cymru's Supporting Independent Living Service is to ensure:

“that housing in Wales will enable people with sight problems to live safely and independently and enjoy the right to privacy, comfort and security in their own home”. This objective is reflected in all our recommendations within this publication.

RNIB Cymru produced “**Housing sight**” (Rees and Lewis, 2003) and “**Adapting homes**” (Rees and Lewis, 2004). These publications raised awareness of how to provide safe and accessible home environments for people with sight loss. In 2005, a number of recommendations from “**Housing sight**” were incorporated into the Welsh Government's Development Quality Requirements (WG, 2005) which registered social landlords have to meet in order to gain social housing grant funding.

Since 2003, RNIB Cymru's Supporting Independent Living Team has continued their work to help ensure their main objective is achieved through access consultancy, research, training and the Visibly Better accreditation scheme.

Welsh housing strategy and the National Dementia Vision for Wales

One of the key priorities of the Welsh Government's housing strategy “**Improving Lives and Communities – Homes in Wales**” (WG, 2010) is meeting the needs of an increasingly ageing population to ensure they can live as independently as possible.

The National Dementia Vision for Wales sets out the Welsh Government's vision to help ensure that people with dementia, their family, friends and carers, are supported across Wales and are able to live well within their communities (WG/Alzheimer's Society, 2011).

It has four main priority areas:

1. Improved service provision through better joint working across health, social care, the third sector and other agencies.
2. Improved early diagnosis and timely interventions.

3. Improved access to better information and support for people with the illness and their carers, including a greater awareness of the need for advocacy.
4. Improved training for those delivering care, including research.

This publication fully supports the priorities of the Dementia Vision for Wales and **“Improving Lives and Communities – Homes in Wales”**. Section 3 demonstrates how housing can be designed, maintained or refurbished to meet the needs of those with dementia and sight loss and to help ensure they can live safely and independently and “enjoy the best possible quality of life” (WG/Alzheimer’s Society, 2011, p3).

“Homes for people with dementia and sight loss” builds on the principles laid down in “Housing sight” and “Adapting homes” and where necessary expands on the previous guidance.

1.3 Objective

Housing associations from across Wales have told RNIB Cymru that some existing information and advice from the dementia field contradicts other best practice guidance; especially relating to meeting the needs of people with sight loss (Goodman and Watson, 2010a and 2010b). There is also currently no definitive guidance on building EMI (Elderly Mentally Ill) wings or Extra Care homes linking in with sight loss and dementia requirements. This publication seeks to address this.

Due to the nature of dementia and the wide and varied symptoms that people experience when they have both sight loss and dementia there is not a “one size fits all” set of recommendations that will meet everyone’s needs. Similarly as dementia progresses someone’s needs may change and further adaptations may be necessary, as what worked previously to support a person’s independence may not continue to support them.

There are however key principles that can be incorporated when designing and refurbishing housing for people with dementia and sight loss and these are detailed in Section 3 – Design guidance.

1.4 Who is this guide for?

“Homes for people with dementia and sight loss” is for everyone involved in the design, development and management of housing or other related disciplines. The guide is particularly aimed at organisations which are designing, refurbishing or maintaining existing sheltered housing stock and those building and designing new Extra Care housing and care homes. It will also be a valuable resource for managers of sheltered housing, Extra Care schemes and care homes.

The design guidance is also valuable when altering or refurbishing a home for an individual with dementia and sight loss.

In addition the principles laid out in this guidance can be applied to other buildings such as surgeries, community centres and hospital wards.

Photographs, case studies and quotes illustrate good and poor practice examples of how to achieve a sustainable, accessible and safe home environment for people with dementia and sight loss. Sources of further information and guidance are provided at the end of each section.

1.5 Standards, regulations, policy, guidance and the Equality Act

1.5.1 Welsh Housing Standard

This guidance aims to complement and is designed to be used in conjunction with the Welsh Housing Quality Standard (WG, 2008) for refurbishing existing homes and the Welsh Government Development Quality Requirements (WG, 2005) for new build homes.

Welsh Housing Quality Standard

The Welsh Housing Quality Standard was introduced in 2002 by the Welsh Government. The Welsh Government’s aim is to ensure that existing housing owned by registered social landlords is of good quality, in a good state of repair and suitable for the needs of existing and future residents (WG, 2008). This guide will be particularly useful for organisations refurbishing sheltered housing stock.

Development Quality Requirements

Since 2005 the Welsh Government has required registered social landlords who construct new homes to meet the regulatory standards with the Development Quality Requirements (WG, 2005). The aim is to have good quality, well designed, flexible and adaptable housing that meets the needs of present and future tenants. To help ensure that housing in Wales is socially, environmentally and economically sustainable the standards require new build homes to meet the standards within the Code for Sustainable Homes, Lifetime Homes, Secured by Design and RNIB Cymru Housing Sight Standards.

In addition the Welsh Government has published **“Guidelines for Developing Extra Care Housing in Wales”** (WG, 2006). It provides guidance to assist local authorities and their partners when developing Extra Care housing.

“Homes for people with dementia and sight loss” aims to be complimentary, and read in conjunction, with the standards within the Development Quality Requirements and the Guidelines for Developing Extra Care Housing in Wales.

1.5.2 Lifetime Homes

The Welsh Government requires that all new social housing is built to standards that incorporate Lifetime Homes principles. The Lifetime Homes Standard developed in 1991 and revised in 2010 sets out 16 design criteria to enable “general needs” housing to provide, either from the outset or through simple and cost-effective adaptation, design solutions that meet the existing and changing needs of diverse households. Housing that is designed to the Lifetime Homes Standard will be convenient for most occupants, including some (but not all) wheelchair users and disabled visitors, without the necessity for substantial alterations (Lifetime Homes, 2013). “Homes for people with dementia and sight loss” is designed to be compatible and read in conjunction with Lifetime Homes.

Further information

www.lifetimehomes.org.co.uk

The Lifetime Homes Design Guide (Goodman, 2011)

1.5.3 Secured by Design

“Secured by Design” is a UK-wide police initiative that seeks to encourage the building industry to “design out crime” and create a safer more secure environment when building and refurbishing buildings (ACPO, 2004a; ACPO, 2004b; ACPO, 2009). This guide is designed to be compatible, and read in conjunction, with Secured by Design. More information at www.securedbydesign.com

1.5.4 Environmental sustainability

The Welsh Government requires registered social landlords to meet the environmental and management standards within the Code for Sustainable Homes (DCLG, 2010) for individual homes; and BREEAM Multi Residential 2008 (BREEAM, 2008) or the multi residential requirements of BREEAM New Construction 2011 for Extra Care housing (BREEAM, 2011).

Wales national planning for sustainable building policy expects all new homes seeking planning permission to achieve an overall minimum Code for Sustainable Homes (CSH) level 3 with higher levels for both energy efficiency and CO2 emissions.

Designers and technical staff from housing organisations have highlighted that they have found difficulty in combining some requirements for accessible homes with environmental standards – for example accessible lever taps versus low flow taps, and dimmable lighting that is environmentally sustainable.

Such possible or perceived conflicts are considered in the relevant areas of Section 3 of this document. The Building Research Establishment (BRE) and the relevant Welsh Government department have both been consulted in order that this publication can provide guidance which will enable housing providers to meet both accessibility and environmental sustainability requirements.

BREEAM standards include consideration of end user requirements, for example, BREEAM New Construction Management 04 requires the design, plan and delivery of accessible, functional and inclusive buildings in consultation with current and future building users.

Where a potential conflict is identified between meeting the accessibility requirements of residents and environmental standards the BRE assessor should be consulted at an early stage.

As outlined below in 1.5.6 and 1.5.7 the Welsh Government is reviewing planning policy and will publish a revised Part L of the Building Regulations during 2014. The proposed changes to Part L will deliver a minimum carbon standard for all new buildings across Wales at a consistent level. As outlined in the consultation on Part L, the Planning Policy review is expected to propose removing the national development management policy expecting a minimum Code/BREEAM standard, but retain the expectation for Local Planning Authorities to assess strategic sites for opportunities to meet higher standards.

The design guidance in Section 3 of this document reflects current planning and building regulations and sets out good practice requirements to achieve accessibility and sustainability. Given the Welsh Government's commitment to sustainable development, including the long-term wellbeing of people and communities, it is anticipated that these good practice requirements will remain relevant.

1.5.5 Welsh Planning Policy

The Welsh Government is reforming the planning system in Wales. At the time of writing a Planning Bill was currently under consultation and is due to be introduced in 2014. The aim of the Planning Bill is to introduce legislation which helps improve the planning system in Wales helping to deliver the homes, jobs and infrastructure that current and future generations need.

Planning Policy Wales, (WG, 2012) sets out the current land use planning policy for Wales, supplemented by Technical Advice Notes.

The sections set out in Section 3 are complementary to those set out in Planning Policy Wales and Technical Advice Note 12: Design (WG, 2009) – promoting the principles of inclusive design which, “places people at the heart of the design process, acknowledges diversity and difference, offers choice where a single design solution cannot accommodate all users, provides for flexibility in use, and, provides buildings and environments that are convenient and enjoyable to use for everyone”.

1.5.6 Building regulations

In England and Wales the design and construction of buildings is covered by the Building Regulations. Building regulations are supported by Approved Documents which give guidance on how to meet the regulations. Approved documents provide guidance on the more common building situations. However there may be alternative ways of achieving compliance within the requirements.

Part L of the Building Regulations covers the Conservation of Fuel and Power; Part M covers Access to, and use of, buildings.

In 2011 the powers in relation to the building regulations were devolved to the Welsh Government. The regulations that were in force at the time of devolution will remain in place until either of the administrations make changes and subsequently issue new requirements. In Wales Part L is currently under review to improve the energy efficiency of buildings and move Wales towards nearly zero carbon buildings. This is due to be released in the summer of 2014.

In England changes to the building regulations in 2013 include updated guidance on Approved Document M – Access to and use of Buildings – as well as other regulatory and Approved Document changes (HM Government, 2013). Details of these changes can be obtained on the Gov.uk website. In Wales, Approved Document M, published in 2010, currently remains in use (HM Government, 2010).

The needs of residents with dementia and sight loss may sometimes potentially conflict with the requirements of the building regulation standards. This should be discussed with the Building Control Officer at the earliest opportunity in order that an exception can be agreed with Building Control.

1.5.7 Good practice guidance on inclusive design

When designing, maintaining and refurbishing properties we recommend that in addition to following the guidance in this document that you consult the good practice guidance within BS 8300 (BSI, 2010). BS 8300 is an excellent source of information for the provision of fully inclusive and accessible environments to meet the needs of people with a range of disabilities.

BS 8300: 2009+A1 2010 Design of buildings and their approaches to meet the needs of disabled people – Code of practice (BSI, 2010).

1.5.8 Wheelchair housing design guide

The Wheelchair housing design guide provides detailed comprehensive advice to assist organisations when they are building or refurbishing housing (Thorpe and Habinteg Housing Association, 2006).

1.5.9 Equality Act 2010

The Equality Act 2010 replaces the previous Disability Discrimination Act. The Equality Act requires providers to ensure that no one using their service is discriminated against because of a disability.

Making reasonable adjustments – The Equality Act 2010

Service providers in Britain have a legal duty to make “reasonable adjustments” to ensure that people are not prevented from using their services because they have a disability. Deciding what is a reasonable adjustment will vary depending on individual circumstances. Service providers need to consider issues such as the cost of the adjustment, the practicality of making it, health and safety factors, the potential benefit to other service users, the size of the organisation, and whether it will achieve the desired effect (CAE/Grant, 2012, pp 6-10).

Reasonable adjustments can be physical changes to a building

The design guidance in this document will help organisations to meet their duties under the Equality Act, by ensuring that the physical aspects of housing are accessible to people with sight loss and/or dementia. However an organisation should be aware that compliance with this guidance does not of itself offer full compliance with the Act. The provision of additional physical changes, extra services, policies and procedures will also need to be considered to ensure that your organisation meets the requirements of the Act.

Section 2 – Dementia and sight loss

This section provides an introduction to dementia and sight loss. It will help you gain an insight into how dementia and sight loss may affect someone's experience of their home, what they can view and how the environment can affect how they are able to move around their home and the built environment.

The section is divided into four parts:

2.1 Sight loss and common eye conditions

2.2 Dementia

2.3 Dementia and sight loss

2.4 Additional considerations.

2.1 Sight loss and common eye conditions

Sight loss can affect individuals in many different ways varying from people who have never seen to those who have experienced deterioration in their vision (RNIB, 2002a). Only four per cent of people who are blind or partially sighted have no sight whatsoever – the majority have varying degrees of sight, depending on their particular sight condition (Bruce et al, 1991).

Many sight conditions are treatable (for example, cataracts). People should have regular eye examinations, whether they live in their own homes, sheltered housing, Extra Care housing or in a residential care setting.

Age-related changes to the eye

Due to natural age-related changes to the eye the majority of people over 50 experience a steady decline in vision.

Natural age-related changes include:

- reduced contrast sensitivity – difficulties defining objects when against each other, difficulties defining boundaries, edges and objects against patterned surfaces
- reduced colour perception
- reduced peripheral vision
- greater glare sensitivity – bright sunlight and artificial lighting can be painful and disorientating, reflections of light from shiny surfaces can cause discomfort
- poorer dark adaptation – difficulties carrying out functions and finding things in low light levels, need for more light
- slower accommodation – more time needed to adapt to light changes, from dark to light and light to dark
- less effective depth perception – for example difficulties judging distances and changes in levels such as ramps, stairs and so on
- loss of visual acuity – close-up objects become blurred, difficulties with picking out finer details.

Therefore most older people will benefit from designs that maximise their vision, such as appropriate lighting schemes, colour and tonally-contrasted environments, non-reflective finishes, plain non-patterned surfaces and easy to understand layouts.

Common eye conditions in older people

As well as natural age-related changes there are also sight conditions that are prevalent in older people. The simulations and common symptoms listed below give an insight into how a sight condition can affect an individual (Rees and Lewis, 2004, p17).

The four most common causes of blindness in the UK are:



Macular degeneration – no central vision, some remaining peripheral vision, way finding difficult, difficulty in judging heights or distances, loss of colour vision, difficulty with carrying tasks which require fine discrimination such as reading.



Cataracts – blurred vision, suffer from glare and find bright light uncomfortable, detail severely reduced, signs hard to read, key features start to merge.



Glaucoma – tunnel vision, too much bright light is painful and reduces vision, getting around may be a problem due to restricted view, may see things at eye level but miss obstacles at floor level, loss of colour vision.



Diabetic retinopathy – patchy vision, lack of sharpness of visual field, scene merges so almost impossible to see direction of travel.

The importance of maximising remaining vision

The natural age-related changes to the eye and the common sight conditions can affect a person's ability to move around safely and independently and increase people's risk of falling and injury (see section 2.3). Additionally 75 per cent of information regarding the environment around us comes from our sight, with the remaining 25 per cent of information gained from the other senses – hearing, touch and smells (see section 2.4). As people's eyes age naturally and/or people develop sight conditions some of this information will be lost. It is therefore vital that the built environment and homes are designed to maximise people's ability to use their available vision and to provide flexibility and choice to meet the needs of individuals.

Eyes and the mind – the link between cognitive function and sight loss

Vision is also vitally important for maximising cognitive performance (that is our ability to perceive, understand and remember). Sight loss can result in a reduction in cognitive performance which in turn can reduce the ability of individuals to make good decisions, carry out daily living activities and live independently (Jones and Trigg, 2007).

Sight loss within Wales and the ageing population

Sight loss is one of the most common disabilities within the UK. Currently in Wales one in nine people over the age of 60 and one in three people over the age of 85 are living with sight loss. There is a predicted rise in people with sight loss in Wales of 11.25 per cent over the next ten years due to an increasingly ageing population. The number of people living with sight loss is set to double over the next 25 years.

(WLGA/RNIB/Action on Hearing Loss and Sense, 2012).

2.2 Dementia

Dementia is one of the most common causes of disability in older people leading to one in three people aged over 65 having a form of dementia (Alzheimer's Research, 2011, p1). Although dementia is more common as people age it can also affect people of working age, including people with learning disabilities who are particularly at risk.

The term "dementia" is used to describe a widespread loss of mental function caused by damage to the brain. The disease is progressive, meaning it gradually gets worse, and often affects people's memory, understanding, language, thinking and their ability to carry out daily living activities.

A number of conditions result in dementia, most commonly Alzheimer's disease (62 per cent) and vascular dementia or mixed dementia (Alzheimer's disease and vascular dementia) (27 per cent). Alzheimer's disease is a physical disease affecting the brain. People with Alzheimer's also have a shortage of some important chemicals which transmit messages within their brain. Alzheimer's is also a progressive disease, which means that gradually, over time, more parts of the brain are damaged and symptoms become more severe.

Vascular dementia is caused by strokes or small vessel disease which affect the supply of oxygen to the brain. The symptoms that a person experiences depends on where the damage to the brain has occurred.

Although people with dementia often experience a range of common symptoms, dementia can have wide and varied effects. The rate of decline and symptoms can be affected by the type of dementia they have, other health conditions, their emotional resilience and support available. This makes each person's experience of dementia an individual one (Knapp and Prince, 2007, p5; Pollock, 2003, p4).

Common dementia symptoms include:

- Communication problems – difficulty finding the right words for things. For example, can describe the function of an item but not the name of it.
- Short term memory loss – forgetting where you are, how to find somewhere familiar or what you have done earlier in the day.
- Disorientation – not knowing the time of day or night or not knowing where you are.
- Confusion – long term memory is usually good but can often come and go intermittently. As the disease progresses may not be able to recognise family members.
- Change in personality – can become irritable, sad, frightened and withdrawn.
- Mobility problems – difficulties moving around, such as going up and down steps and stairs.
- Self-neglect – in the later stages of dementia, may not be able to look after yourself and become increasingly dependent on other people to care for you.

Dementia and the ageing population

It is estimated that there are currently around 750,000 people in the UK with dementia (WG/Alzheimer's Society, 2011, p6). This figure is predicted to rise rapidly by 38 per cent by 2021 and by 154 per cent by 2051 as the UK's ageing population increases (Knapp and Prince, 2007).

Dementia in Wales

It is estimated that there are currently around 44,500 people in Wales with dementia. With an ageing population, this figure is set to rise by 30 per cent in urban areas and as much as 44 per cent in rural areas by 2021 (WG/Alzheimer's Society, 2011. p2). These predicted increases will place an increasing demand on the need for housing, health and social care to meet the needs of individuals with dementia over the next ten to forty years.

2.3. Dementia and sight loss

People with dementia often have other health needs and conditions which tend to increase as people with dementia age (WG/Alzheimer's Society, 2011, p7). As discussed in Section 2.1 one of the most common health issues that can affect people as they age is sight loss, either due to a sight condition and/or due to natural age-related changes to the eye. The combination of both dementia and sight loss can have a large and often dramatic effect on a person's ability to cope with the symptoms of dementia.

Sight loss can also be caused by dementia itself. People with dementia often experience changes in visual functioning or visual perception due to neurological impairments, including problems with depth perception, glare and visual mistakes or misrepresentations (Mendez, Cherrier, and Meadows, 1996). Visual mistakes can take the form of illusions, misperceptions, misidentifications and sometimes even hallucinations. These changes in vision can further be exacerbated by natural age-related changes to the eye and/or sight conditions.

To summarise, someone who has both dementia and sight loss will be in one of three situations:

- A person with dementia whose visual functioning is affected by brain changes caused by the dementia but who does not have a separate eye condition; the brain cannot interpret and process the information from the eyes which are healthy.
- A person with dementia who does not have impairment of the brain functions associated with vision but has an eye condition such as macular degeneration or cataract.
- A person who has a combination of the above.

Sight loss caused by dementia

As discussed above some forms of dementia can cause visual functioning or visual perception difficulties in addition to the normal age-related changes to the eye and the development of sight conditions. Some of the visual difficulties experienced by people with dementia are similar to those produced by the natural age-related changes to the eye and sight conditions.

How Alzheimer's disease can affect vision

Sight-related symptoms that affect people who have the most common form of dementia include:

- Changes in colour perception – difficulties detecting differences in colour, difficulties seeing pastel colours or dark colours.
- Depth and movement perception – difficulties judging changes in levels such as steps and ramps, difficulties crossing a road with busy traffic.
- Difficulties recognising faces and objects.
- Reduced contrast sensitivity – difficulties seeing objects against each other.
- Reduction in visual acuity – finer detail more difficult to see, close up images more blurred, difficulties reading.
- Difficulties with reflections and glare from shiny surfaces and light sources.
- Visual perception difficulties – misinterpreting the environment.

The progression of Alzheimer's disease can sometimes be categorised into three phases of dementia. Each phase will affect someone's ability to carry out daily living activities. Common symptoms within the three phases include:

Early phase

- Forgetful about things that have just happened.
- Forget where they are, or what they did five minutes ago.
- Long-term memory usually unaffected.

Middle or moderate phase

- Confusion becomes more apparent.
- Greater forgetfulness and mood changes.
- Person may become anxious and aggressive.
- May wander and be restless.
- May develop paranoia often directed towards family or carers.
- Daily living activities become difficult or impossible without assistance.

Final phase long-term memory may be retained

- Person will often lose the ability to remember even close family members.
- Person will often become incontinent.
- In very late stages person will become very frail and likely to be bed-bound.

(Alzheimer's Society, 2011a; Jones and van der Eerdan, 2008)

How post cortical atrophy can affect vision

Post cortical atrophy (PCA) also known as Benson's syndrome is often caused by Alzheimer's disease. It can also be due to other diseases including dementia with Lewy bodies and Creutzfeldt Jacob disease. It is a rare condition thought to affect approximately five per cent of older people with Alzheimer's disease, although figures may be higher as epidemiological studies have been limited and in the past PCA has been under diagnosed (Alzheimer's Society, 2010).

Common problems that can affect vision and daily living include:

- Early on in the disease vision declines. People have difficulties with reading and performing skilled movements but memory is good early on. As disease progresses people show symptoms common in Alzheimer's disease.
- Depression.
- Visual hallucinations.
- Visual perception difficulties – misinterpreting the environment.
- Difficulties in reading, writing, cooking and moving around the environment.
- Difficulties recognising faces or objects.
- Decline in spatial awareness and judging distances and speeds.
- Increased sensitivity to bright lights, sunlight, unshielded lights and glare off shiny surfaces.
- Double vision.
- Difficulties seeing in low light levels or fading light.

(Alzheimer's Society, 2010)

How vascular dementia or arterosclerosis dementia can affect vision

Vascular dementia is the second most common form of dementia after Alzheimer's disease and affects approximately 17 per cent of older people with dementia (Knapp and Prince, 2007, p33). Vascular dementia is caused by strokes or small vessel disease which affects the supply of oxygen to the brain. The symptoms that a person experiences depend on where the damage to the brain has occurred. The disease develops in a similar way to Alzheimer's but progression is "stepped" with symptoms tending to remain constant and then suddenly deteriorating (Knapp and Prince, 2007, p5).

Common symptoms that affect vision and daily living include:

- Visual perception difficulties – misinterpretation of the environment.
- Visual loss/blurred vision – this is sometimes temporary.
- Wandering and getting lost.
- Memory problems.
- Confusion.
- Problems with continence.
- Problems concentrating and communicating.

(Alzheimer's Society, 2011b; Knapp and Prince, 2007)

How dementia with Lewy bodies can affect vision

Dementia with Lewy bodies is a form of dementia that shares similar symptoms to those found in both Alzheimer's and Parkinson's diseases. It accounts for approximately four per cent of all cases of dementia in older people.

Common problems that effect vision and daily living include:

- Similar symptoms to Alzheimer's (see above).
- Visual hallucinations.
- Visual perception difficulties.
- Mobility is often impaired, disturbances in gait and posture – difficulties walking or moving around.
- Fluctuating cognition – changes in abilities on a daily basis.

- Memory problems.
- Difficulties concentrating on tasks.
- Difficulties communicating.
- Difficulties reading – for example difficulties seeing position of dials on appliances.
- Difficulties identifying size and shape of objects.
- Spatial disorientation.
- Repeated falls.
- Depression.
- Person's abilities may fluctuate.

(Armstrong, 2003; Knapp and Prince, 2007, p7 and p32; Dementia Guide, 2011a)

How dementia caused by Parkinson's disease can affect vision

Dementia caused by Parkinson's disease accounts for approximately two per cent of older people with dementia.

Common problems that effect vision and daily living include:

- Similar symptoms to Alzheimer's but do not develop in the same order. For example, hallucinations may develop early on in Parkinson's, but do not occur till later in Alzheimer's.
- Fluctuating cognition – changes in abilities on a daily basis
- Visual hallucinations.
- Illusions – patterns on carpets or wallpaper may seem like moving objects.
- Visual perception difficulties – misinterpretation of the environment.
- Memory problems, forgetfulness and difficulties concentrating leading to difficulties carrying out daily living activities such as dressing, cooking, cleaning.
- Depression.
- Repeated falls.

Parkinson's UK (2011a and 2011b) and Dementia Guide (2011b)

Medications can affect vision

Furthermore, many medications affect people's vision. Many of these are commonly taken by older people and can further compound the difficulties that people experience with dementia. For example many cardiovascular drugs, steroidal anti-inflammatory drugs, antibiotics and some eye medications can affect people's vision.

Further Reading

Alzheimer's Society (2012) Sight, perception and hallucinations in dementia. Factsheet 527.

For further information on dementia please see the Alzheimer's Society factsheets "**What is dementia?**" and other associated factsheets at www.alzheimers.org.uk

Combined effect of having both dementia and sight loss

As individual conditions dementia and sight loss can have a great effect on people's ability to carry out normal daily activities and move around safely and independently around the built environment and the home. "When they occur together they can have a further negative effect on daily living, mobility, wellbeing and communication and lead to profound disorientation and isolation" (RNIB and Thomas Pocklington Trust, 2009).

As approximately 75 per cent of information is gained from our vision, the loss of part of this major sense can have a dramatic effect on someone's ability to cope with dementia and the effect of the combination of both dementia and sight loss is often much more severe than difficulties caused by either conditions alone (Jones and Trigg, 2007, p1).

Problems can be compounded by:

- The fact that the use of normal compensating methods to overcome sight loss can be affected by problems with memory and thinking processes caused by the dementia (Jones and Trigg, 2007, p12).
- The combination of being unable to compensate for poor memory with visual cues due to the dementia, can affect the ability of someone to carry out daily living activities (Lawrence et al, 2008, p9). This means that having dementia will affect a person's ability to process information, act on visual cues, and make decisions on everyday living.

Common problems experienced by people who have both dementia and sight loss

Common problems that occur with sight loss and dementia that should be taken into consideration when designing, refurbishing and maintaining homes and environments include:

Distance and space

- Problems with depth perception, for example steps, stairs and changes in level can be a problem, difficulties with judging distance of an object or making out a shape.
- Difficulties estimating depth of field, for example positioning yourself on a chair, toilet or bed.
- Lack of spatial awareness.

Colour and contrast

- Loss of contrast sensitivity – difficulty finding objects that are the same colour (lack of tonal contrast) such as a white rocker on a white switch.
- Can't find way to the toilet if the door is the same colour as the wall.
- Can't see the toilet pan if the toilet seat is white and the toilet is white (resulting in a resident missing toilet when urinating).

Surfaces

- Not walking on shiny flooring because it looks slippery.
- Mistaking reflections in shiny surfaces for other people such as windows, mirrors, glossy tiles, and glossy kitchens.
- Difficulties judging and crossing changes in surfaces such as texture, colours, shadows and carpet rods.
- High stepping over shadows, carpet rods and changes in surfaces.
- Not wanting to enter a lift with a very dark floor as it is perceived as a dark hole.
- Not wanting to cross over a manhole in the ground as it is perceived as a hole.

Patterns and designs

- Difficulties with visually overstimulating environments such as cluttered notice board masking wayfinding cues.
- Patterns making wayfinding difficult, for example highly patterned wallpaper can be visually distracting, patterned carpet can be visually confusing.
- Patterns causing difficulties in finding objects, for example can't find remote control on bedspread, or fork on speckled worktop.
- Representational design being seen as real life objects. For example photographs of people being perceived as real people, flowers on wallpaper being seen as real flowers.
- Difficulties with environments that are understimulating as they can result in sensory deprivation.

Lighting

- Difficulties moving around in low light levels.
- Sudden changes in light levels cause difficulties for people with both dementia and sight loss to adapt.
- Shadows can be confusing and can sometimes be seen as steps.
- Sensitive to glare from natural sunlight, artificial lighting and reflections from shiny surfaces.

Physical consequences

- Vision can become blurred – objects are less sharp.
- Disorientation about time or place, for example not knowing how to find your way to the bedroom.
- Misidentifications, misinterpretations and illusions. Visual hallucinations (caused by either sight condition or dementia).
- Noise – people can be confused and not be able to interpret sounds or spoken words, which can be distressing.
- Mobility problems when moving around the built environment.
- Increase in falls.

(Examples taken from current research, Alzheimer's Society, 2011a; Jones and Van der Eerden, 2008)

Dementia and sight loss and the ageing population

At least 123,000 older people within the UK are living with sight loss and dementia (Jones and Trigg, 2007).

Due to natural age-related changes to the eye, the majority of people over 50 with dementia will have some form of sight loss. As people with dementia age they may also develop one or more of sight conditions that commonly occur in older people such as macular degeneration, cataracts, glaucoma and diabetic retinopathy (See Section 2.1) (RNIB and Thomas Pocklington Trust, 2009).

As people age they are more susceptible to strokes which can affect vision and bring on some forms of dementia.

Across the UK due to predicted increases in the ageing population the prevalence of sight loss and dementia is inevitably going to increase.

Dementia and sight loss – injuries and accidents

Changes in vision due to dementia, loss of hearing and the loss of proprioceptive feedback (knowing where your body is positioned and what it is touching) can put older people at risk of falls and injury, both within their own home and when using the built environment.

Falls are one of the most common causes of injuries in older people and many falls lead to serious injury (Gribben et al, 2009). It is estimated that between 30 and 60 per cent of older adults fall each year, with around half of these falling more than once. The incidence rises with age such that half of women and a third of men aged over 85 fall every year (Cummings and Melton, 2002; Peel et al., 2002 cited in NHS Wales, 2011). Of those who fall, between 5 and 10 per cent suffer a fracture, head injury or serious laceration (Rubenstein and Josephson, 2002 cited in NHS Wales, 2011). “In Wales every year there are around 4,200 hip fractures, many occur as the result of an accidental fall. About one quarter of people with hip fractures die within six months of the injury and half of survivors fail to gain their previous independence” (CAPIC, 2002, p.13).

Many of these falls amongst older people are the result of poor eyesight/ and or environmental conditions. Falls are very common in the home environment amongst older people who spend a great deal of time within their own home with the most serious accidents happening in the kitchen and on the stairs. “The largest proportions of accidents are falls from stairs

or steps with over 60 per cent of accident related deaths resulting from accidents on stairs. Fifteen per cent of falls are from a chair or out of bed ,and a similar number are caused by a slip or trip on the same level, eg. falling over a mat or a rug” (Rospa, 2013).

“Good design can play a vital part in reducing injuries and creating a safer environment in which people can live”(Rees and Lewis, 2003; Chaplin 2011). It is therefore vital when designing, maintaining or refurbishing homes that the needs of people with dementia and sight loss are taken into consideration to try and keep falls and accidents to a minimum.

2.4 Additional considerations

The senses: smell, taste, hearing, touch, proprioceptive stimulation and vestibular stimulation, are all affected as people get older. For example older adults may experience not being able to smell certain smells or taste some foods. The reduction of the senses can make people feel isolated and depressed and can have a significant impact on people with dementia (Briller et al 2001, p2).

Dementia can also have an effect on other senses and alter how people interpret not only what they see but what they feel, taste and smell, further compounding difficulties experienced. Dementia can not only cause visual hallucinations but hallucinations or misinterpretations in the other senses (hearing, touch, smell, taste, and perception of the body, although visual hallucinations are the most common) (Alzheimer’s Society, 2010b).

Our senses help people interpret their world and alongside good care provision there is much the built environment can do to support these senses and help people with dementia enjoy and interpret the world around them (Briller et al, 2001, p1). This will be explored in Section 3.

Dementia and hearing loss

People with mild hearing loss have nearly twice the chance of developing dementia compared to people with normal hearing. The risk increases threefold for those with moderate hearing loss and fivefold for severe hearing loss (WLGGA/RNIB/Sense and Action for Hearing Loss, 2012).

Due to natural age-related changes to ears as people get older they can start to lose their hearing. For example more than 40 per cent of people over

50 and 70 per cent of people over 70 have some form of hearing loss (Action on Hearing Loss, 2011). Many of these people will also have dementia.

In a similar way to sight loss, hearing loss is often regarded as a sign of getting old and many people do not realise or take action to support themselves to improve hearing.

For example:

- About two million people in the UK have hearing aids, but only 1.4 million use them regularly.
- At least four million people who don't have hearing aids would benefit from using them.
- On average it takes ten years for people to address their hearing loss.

(Action on Hearing Loss, 2011)

Symptoms of dementia and hearing loss include:

- not being able to understand what people say
- not being able to hear their own voice
- not being able to hear people with a noisy background
- difficulties interpreting sounds
- difficulties knowing where a sound is coming from
- difficulties deciphering a sound against other sounds
- some sounds may become irritating and excessively loud
- high pitched sounds can be difficult to hear, for example the telephone
- a person may have difficulties orientating themselves in an environment or the time of day because they can no longer use sound as a cue
- reduction in spatial awareness and balance
- higher risk of falls
- sensitivity to excess noise or sudden noises
- ringing in someone's ear caused by tinnitus.

McManus and McClenaghan (2010, pp17-18)

These symptoms can cause stress, anxiety, social withdrawal and isolation, loss of self-esteem and increased feelings of insecurity (Pichora-Fuller and Carson, 2001).

Dementia and dual sensory loss

The combination of hearing loss and sight loss is prevalent in older people and with an estimated 62 per cent of people aged over 70 having both a hearing and a sight loss. This figure is predicted to rise dramatically due to the UK's ageing population; with the number of people over 70 who have both a hearing and sight loss set to double from 222,000 to 418,000 by 2030 (Sense, 2010). Many of these people are also likely to have dementia.

This loss of hearing with or without sight loss can compound the effects of dementia for an individual. It is therefore vital that the built environment is designed to maximise people's hearing and sight to try and limit the effects that losing these vital senses can have on someone who also has dementia.

For people who have both cognitive and sensory impairments, it is vital that the environment is cognitively accessible as well as offering sensory access. The environment must be understandable and navigable, it must be usable and make sense to the person.

The role of housing design in supporting people with sensory loss and/or dementia

Building, refurbishing and maintaining accessible housing is a key strategy in promoting independence and reducing the impact of sight loss, sensory loss and/or dementia and minimising the effects of losing one or more senses. Each principle within Section 3 is designed to support people with dementia who may also have sensory loss.

Section 3 – Design guidance

The need for inclusive design to meet the needs of an ageing population

Managing the home environment is a key area that can reduce the impact of having dementia and sight loss. Section 3 details design guidance that is based on the following values:

- Reduce the impact of sight loss and dementia.
- Maximise independence, safety and enjoyment of the home environment.
- Ensure risks are minimised and residents are safe and secure.
- Promote a good quality of life.
- Reduce falls.
- Promote people’s dignity.
- A useable, understandable and navigable environment.
- A home where a person can build meaningful memories and relationships that contribute to their personhood, a place that is “lived in” and that helps them to feel some ownership of their own space and time and an emotional attachment to it.

Key design guidance

This section discusses the key design guidance to consider when designing new or refurbishing existing homes for people with dementia and sight loss:

3.1 Lighting: natural light, glare, reflections and shadows

3.2 Lighting: an inclusive lighting system

3.3 Colour: using contrast

3.4 Colour: creating schemes

3.5 Surface Finishes

3.6 The ‘seeing is believing’ concept

3.7 Acoustics

3.8 Wayfinding

- 3.9 Signage: a key part of a wayfinding strategy**
- 3.10 Distinctive rooms/areas for activities**
- 3.11 Handrails and rest areas along routes**
- 3.12 Products and controls**
- 3.13 Assistive technology**
- 3.14 Accessible gardens and external areas**
- 3.15 The provision of dementia wards.**

3.1 Lighting: natural light, glare, reflections and shadows

This section explores:

- 3.1.1 The importance of natural light and views**
- 3.1.2 Controlling glare**
- 3.1.3 Reducing reflections – glazing and mirrors**
- 3.1.4 Minimise shadows**

3.1.1 The importance of natural light and views

Natural light is the best form of light for people with sight loss and dementia as it gives a true colour rendition of the environment which helps people to see as clearly as possible.

Natural lighting can, however, be an unreliable source of light which can change throughout the day depending on a building's orientation and the time of year. Natural light can also be a source of glare and can cause reflections and shadows which can make it difficult for people with dementia and sight loss to interpret the environment clearly. What is needed within a building is a comprehensive way of harvesting natural light whilst ensuring that any potential negative effects can be minimised (Bright and Cook, 2010, p50).

Views to the outside

“People with dementia are less likely to become frustrated if they can clearly see their environment.”

(Housing and Learning Improvement Network, 2008, p9)

Views to the outside are essential for people with dementia and sight loss as they reinforce seasons, times of day, and enable people to view external areas such as gardens and communal areas even if they are unable to go outside.

Single bank corridors enable people to leave their flat or bedroom and take in views from outside. This helps support a visually accessible environment by providing good visual cues which can assist in orientation and wayfinding. It is however appreciated, due to cost, that the provision of single banked corridors may not always be possible.

“The sun is blinding in the lounge, but when the curtains are pulled it is too dark”. Manager of a care home built 20 years ago

Natural light can be harnessed and areas kept as light as possible through:

- Use of windows, sun pipes, glass blocks, roof windows, glazed doors
- Installing curtains and blinds that do not obscure the windows and are able to be pushed back or up to maximise natural light
- Use of light coloured blinds if blinds are closed
- Use of lighter fabrics, room surfaces and furnishings
- Use of low window sill levels – for views from a seated position
- Provision of single bank corridors where possible

3.1.2 Controlling glare

Older people, people with some eye conditions and some people with sight loss caused by dementia find glare very uncomfortable, painful, and disorientating. It can obscure vision and put people at risk of falling. For people who are deaf or hard of hearing glare can make it difficult for people to lip read. Additionally for some people with dementia and sight loss, glare can cause illusions.

Care must be taken that light levels can be managed to ensure that natural light does not cause glare. Each building and room is individual and there is no prescriptive way of controlling glare. Care home, Sheltered and Extra Care managers need to ensure light levels are managed within their scheme. Controls must be easy to use to enable an individual within their own home to be able to adjust light levels to suit their individual requirements.

There are two forms of glare – disability glare that causes vision to be impaired and discomfort glare that causes discomfort to the person. These can occur independently or together.

Disability glare – for example often occurs when objects are viewed (silhouetted) against a window at the end of a corridor.

Discomfort glare – occurs when the source of illumination, such as sunlight or light bulb is in the direct field of view.

Given the nature and constant use of communal areas, apartments and bedrooms particular attention should be paid to ensure that the levels of sunlight and glare can be controlled throughout the day, certain times of the day and certain times in the year (CAE/RIBA, 2006, p15).

Glare, or the effects of glare, can be reduced by:

- Carefully placed windows
- Tinted glass – lighting levels and thermal requirements will need to be considered as these can be affected by tinting. This option should be used with caution if the windows face onto communal areas or access routes as they are likely to be highly reflective and cause a mirror-like effect.
- External sun louvres – note these may reduce the daylight factor.
- Blinds, brise-soleil, low eaves or bioclimatic design – to allow glare control without blocking out all daylight.

- Light diffusing blinds – when using horizontal or vertical blinds ensure that these do not cause shadows at certain times of the day.
- Avoiding use of glossy or shiny surfaces – as they can be reflective and cause glare.
- Arranging the room such that the sky is not in the immediate view of an object. For example, not placing a reception desk or television in front of a window.
- Use of reflective coated glass which reflects a proportion of daylight. This option should be used with caution if the windows face onto communal areas or access routes.
- Use of anti-glare film that reflects or absorbs some of the daylight.
- Reducing contrast against the window and the wall by having splayed reveals and having a light coloured wall around window.

(CAE/RIBA 2006, p.15-17).

2-year old Nursing Home:

“People could not walk up stairs at certain times of the day due to glare coming from the large south-facing window at the top of the stairs. Voiles were placed over this window which alleviated glare and meant people could walk up the stairs.” **Nursing home manager**



Photographs – Vertical blinds used to control natural light levels and glare in communal lounges. Photographs courtesy of Linc Cymru

3.1.3 Reducing reflections – glazing and mirrors

People with sight loss and/or dementia can find reflections confusing, disorientating and sometimes frightening.

It is important that glazing both internally and externally does not create distracting reflections (Approved Document M (2004) 2.29; CAE/RIBA, 2006, p17).

Ways of reducing reflection:

- Position glazing so that it is not seen against a dark background.
- Provide similar lighting levels either side of glass.
- Avoid use of glass opposite a window.
- Use tinted glass only where it cannot act as a mirror.
- Use matt surfaces to minimise reflections.
- Use blinds to minimise reflections.

(CAE/RIBA, 2006, pp17-18).

Glazing

Large areas of transparent glazing in doors and screens can represent a risk of injury, through collision, to users of a building who may be unaware of the physical barrier (CAE/RIBA, 2006, p11). Large areas of glazing should be highlighted by manifestations, and the presence of doors should be emphasised by colour contrasted large frames, transoms, large handles or push plates (CAE/RIBA, 2006, p19).

Manifestations should be set at two levels from 850mm to 1000mm and 1400mm to 1600mm so that they can be seen by wheelchair users, persons of small stature, and children, as well as at adult eye level (BSI, 2010). Any logos or decorative features should be at least 150mm high and form a virtually continuous band across the glazed area. They should contrast visually with their backgrounds and be seen through the glass in all light and weather conditions. For entrance doors, on approaching the building from the outside, the markings must contrast visually with the entrance foyer floor. From inside the building, the background colour is likely to be that of the approach route to the building.

This can be difficult to achieve with a single tone material and therefore a two tone manifestation will be more likely to “provide effective visual contrast viewed against a variety of backgrounds” (CAE/RIBA, 2006, p12)

Photograph – In this Extra Care home glazed screens and doors were clearly highlighted by thick transoms and wide frames.

Photograph courtesy of Linc-Cymru



Case study: Glazed doors and windows at end of corridor

Photograph – This door needs measures to control light at certain times of the day. The fully glazed door is a potential danger to residents as the glazing is not highlighted (Please see recommendations above in section 3.1.3 for highlighting glazing).

During our research we came across a nursing home with a fully glazed locked door at the end of a corridor. This caused distress, frustration and anger to one resident with dementia who was constantly trying to open the door to go out into the garden.



A blind or frosted glass is one potential solution.

If such a problem were within an existing (rather than planned) building it would be appropriate to incorporate a blind that could be pulled down to try and alleviate this problem for the residents. Applying a frosted sheet over the glass may be another measure if the blind does not alleviate the problem.

If room allows, adding a table and chair may alleviate the problem. “Dead-end” situations should be negated by having an event or feature at the end of a corridor such as a table and chair. This helps support people who have been pacing and wandering and enables them to rest at the end of corridors. Careful design and positioning is needed to ensure that this is not an obstruction for people with sight loss.

Further reading

Glass in buildings: Specifiers handbook for inclusive design. CAE/RIBA (2006)

Mirrors

For some people with dementia and/or sight loss mirrors can cause confusion and be disorientating. Some people with dementia find seeing their own reflection in a mirror a frightening experience.

We recommend that mirrors are used with caution when designing interiors.

Mirrors in lifts

Full and half-length mirrors are often placed in lifts. However, mirrors in a lift may prevent individuals with dementia from wanting to use it as they may find their own reflection frightening or perceive the lift to be full. When considering lifts, thought should go into whether the use of a mirror is necessary.

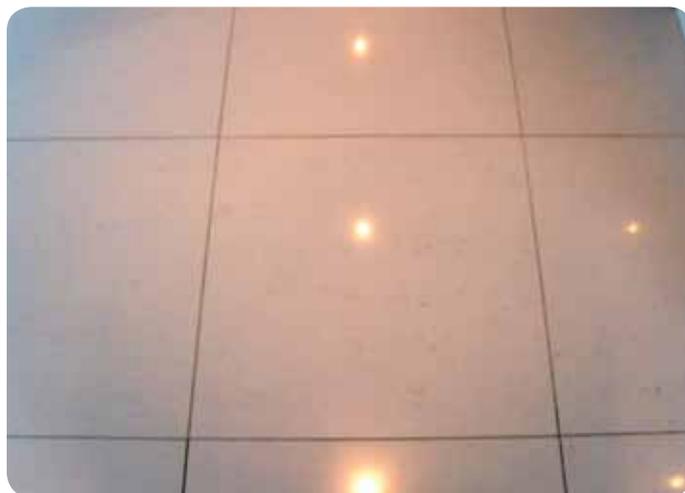
There are however occasions where mirrors in lifts are essential. In smaller lifts where lifts have one door and have the minimum dimensions of 1100mm by 1400mm it is essential that a half height mirror is incorporated to enable wheelchair users to manoeuvre in and out of the lift. Full-length mirrors should be avoided and the mirror should not extend below 900mm so as not to cause confusion as full length mirrors can be seen as an open corridor.

It would be appropriate to consider fitting a cover or blind that can be pulled over mirrors in lifts to pre-empt residents finding reflections from mirrors distressing.

Mirrors in bathrooms/bedroom areas

Thought should be given to providing mirrors that can either be removed, covered or a blind placed over the mirror to enable an individual's bedroom/bathroom to be adapted to suit individual's needs.

Photograph – The spot lighting is causing reflections on the shiny floor. Residents may not like to walk on the floor due to the reflective surface and spot lights reflecting onto the surface.



Photographs – Blind used to cover mirror in assisted bathroom.

Photographs courtesy of Linc Cymru



3.1.4 Minimising shadows

Glazed areas are a good feature within a building as they provide connections with outside areas; however, thought should go into minimising the effects of shadows on walls and floors.

Areas of glass such as glazed atria, glazed entrances and curtain walling can cause shadows and reflections on floors and walls, particularly if floors are light coloured. For example, when light shines through windows with glazing bars, reflections and shadows may be seen on walls and floors. These shadows can be confusing for people with dementia and/or sight loss and they may disguise key features in a building. In some cases where the shadow forms stripes they may be seen as a series of steps which could cause someone with dementia/and or sight loss to fall.

Shadows can be reduced by providing shading and having a matt non-reflective floor (CAE/RIBA, 2006, pp17-18).

Environmental sustainability and natural lighting

This section helps designers to meet the requirements of:

- The Code for Sustainable Homes (DCLG, 2010) Health and Wellbeing issue Hea 1 – Daylighting.
- BREEAM New Construction Multi-residential Scheme, Health and Wellbeing issue Hea 1 – Daylighting and Visual comfort within Hea 5 Internal and external lighting levels under Multi-residential 2008 (BREEAM, 2008).

While CSH and BREEAM require a daylight factor of 2 per cent, in order to support people with dementia and sight loss we recommend this is increased to between 2 per cent and 5 per cent. This should decrease the need for artificial lighting during daylight conditions.

3.2 Lighting: an inclusive lighting system

This section explores the following design considerations:

3.2.1 The importance of providing good lighting

3.2.2 Even spread of light (ambient lighting)

3.2.3 Multiple light fittings

3.2.4 Diffused lighting

3.2.5 Transitional lighting

3.2.6 Colour rendering

3.2.7 Adaptable lighting

3.2.8 Task lighting

3.2.9 Sufficient lux levels

3.2.10 Lighting maintenance

3.2.11 Environmental sustainability and choice of bulbs

3.2.12 Additional considerations

- Light switches and sockets
- Sensor lighting
- Night time lighting
- Colour and furnishings

3.2.1 The importance of providing good lighting

Providing a system of “good lighting is one of the best low vision aids available.” **(Rumney, 1992)**

A good lighting system helps keep everyone safe and independent and in particular helps ensure that people with dementia and sight loss can make the most of their vision.

While a good lighting system will support people with dementia and sight loss, lighting cannot compensate for a lack of colour and tonal contrast in the environment. It is therefore vital that the environment provides a system

of good lighting alongside sufficient levels of colour and tonal contrast to define the size, shape and key features within a room or space. (Please see design guidance on colour and tonal contrast in Section 3.3)

As we get older we need more light, with a 60 year old needing around three times as much light as a 20 year old. While most people with sight loss need and benefit from enhanced lighting, there are some eye conditions which cause people to experience glare problems in normal lighting levels, which could be uncomfortable or even intolerable for them.

Some people find when they go from a bright room to a dark room it may take several minutes for their eyes to adjust to the new light levels.

As people with dementia and sight loss often misinterpret what they see, good lighting can help reduce the stress caused by not being able to interpret the environment. Good lighting can enable people to see the environment as clearly as possible.

Good lighting has been shown to:

- reduce some cases of hallucinations (Pankow et al, 1996)
- reduce the incidents of falls and accidents
- reduce cases of incontinence in the night time
- support wayfinding and security
- assist with identification of access routes, landmarks, spaces and objects within rooms
- help ensure that people and their facial expressions can be seen clearly
- assist with undertaking daily living activities safely and independently such as opening a door, washing, cooking and cleaning.

Due to the varied nature of sight loss caused by dementia and sight conditions there is not one way of lighting a room that is perfect for everyone. In general, providing a good, even spread of light that is fully diffused and flexible to meet people's individual needs can promote the safety and independence of people with dementia and sight loss.

Key principles when designing a lighting system:

- Provide an **even** spread of light.
- Consider natural and **multiple** artificial light sources.
- Ensure lighting is fully **diffused** or positioned so that bare bulbs cannot be viewed.
- Incorporate **transitional** lighting.
- Ensure lighting gives good colour rendition.
- Provide adaptable lighting controls whenever possible.
- Install portable and permanent task lighting where necessary.
- Ensure sufficient lux levels are provided in specific areas.
- Incorporate a lighting maintenance and replacement plan.
- Consider environmental sustainability.

These principles are discussed in a little more detail in this section.

3.2.2 Even spread of light (ambient lighting)

Care home built 20 years ago:

“Before lighting was upgraded to provide an even spread of light across the whole of the dining room we had a couple of falls.”

Care home manager

A good, even spread of light (ambient lighting) across internal and external routes and within rooms is vital for people with dementia and sight loss to help reduce the incidences of falls, illusions and hallucinations.

3.2.3 Multiple light fittings

In larger communal areas to gain a good even spread of light we recommend considering multi light sources throughout, where pendant, wall, table and standard lamps, for example, are all used within one setting or room to create an even spread of light that highlights key features within the room and the size and shape of the room.

Smaller rooms in flats or bedrooms are normally lit by one central light. Rather than using one very bright light bulb to light the room it may be necessary to use two or more pendant lights and if necessary increase lighting in the room with wall lighting and table lamps.

Spotlights should not be used as the sole light source in an area since this method of lighting creates “pools” of light and dark and they can also be a source of glare. However, recessed closely-grouped spotlights can be effectively used to supplement ambient lighting. Care should be exercised when installing feature lighting in reception areas, to ensure that shadows are not being cast over people’s faces, making lip-reading especially difficult.

Photograph – Diffused pendant lighting and wall lighting being used to create a system of ambient lighting in a room.

Photograph courtesy of Linc Cymru



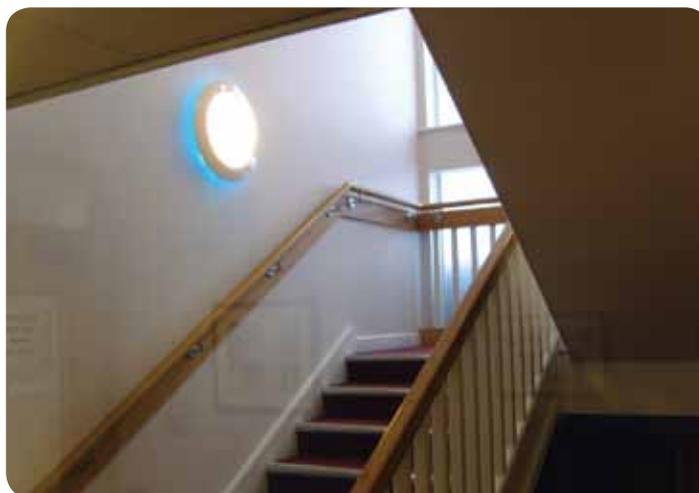
3.2.4 Diffused lighting

Lighting should be chosen and positioned to prevent glare when viewed from the normal viewing angle. The position of lamps should make it impossible to look directly at a lamp or alternatively the lamp should have a cover that fully diffuses the bulb in order that the bulb cannot be viewed through the diffuser or shade.

Photo – Glare being emitted from un-diffused shade in bathroom.



Photograph – Lighting at top of stairs with fully diffused cover which provides light but no glare. The handrail in the image is warm to touch, contrasts against its background and is round in profile in line with the recommendations in Section 3.11.1.



Photograph courtesy of Linc Cymru

3.2.5 Transitional lighting

Older people's eyes take longer to adapt to sudden changes in light levels – from dark to light and from light to dark. When coming in from the outside it can take 5 to 30 minutes for an older person's eyes to adapt to the change.

Designers need to provide a gradual decrease in lighting when people move from the inside of buildings to the outside after dusk, and a further gradual decrease when moving away from the building. When entering a building in daylight hours lighting designers need to provide for a gradual decrease in the lighting from the point of entry into the building (Thomas Pocklington Trust and Habinteg Housing Association, 2008, p85). This assists everyone and particularly those with sight loss by providing gradual eye adaptation times.

Providing waiting areas internally and externally close to entrances and exits can support people to sit and rest whilst they are waiting for their eyes to adapt to the lighting.

3.2.6 Colour rendering

Lighting can have an effect on how colours are seen. It is advisable to use bulbs that give a light as close to daylight as possible in order that the true colours are seen and good colour rendering is achieved. For example, in a dining room it is very important that lighting achieves good colour rendering to ensure that food colours are replicated and food appears inviting and satisfying.

Colour rendering is given as an index between 0 and 100 Ra, where lower values indicate poor colour rendering and higher ones good colour rendering. Ensuring the bulb has a colour rendering index of 80 or above will achieve good levels.

3.2.7 Adaptable lighting

Adapting to changes in light levels is a real problem with certain eye conditions. Dimmer switches can be very useful to control levels of illumination and glare and can create a system of lighting design that is suitable for an individual.

Some bulbs are not currently dimmable and this should be taken into consideration when purchasing light fittings and designing lighting schemes.

Delays in lighting coming on when detected by a sensor may put some people with dementia and sight loss at risk. We recommend using bulbs with no warm-up time to ensure areas are lit immediately.

3.2.8 Task lighting

Daily living activities such as reading, cooking, brushing teeth need focused lighting to help people with dementia and sight loss carry out tasks.

Increasing the amount of light on the task can make it easier to see, less tiring to do and may help people with dementia concentrate better on the task (RNIB and Thomas Pocklington Trust, 2012; Briller et al, 2001, p16).

Task lighting to consider to support people with dementia and sight loss include:

- Wardrobe lighting
- Moveable lamps to support tasks such as reading, writing etc
- Under-cupboard lighting to wall units in kitchens to highlight the worktop. A pelmet may be needed on the base of the wall unit to shield the user from glare.
- Lighting over sinks and hobs in kitchen
- Lighting over sinks and either side of the mirror in bathrooms.

Task lighting should not emit glare and must be positioned so that it does not cast shadows. If the task light is within easy reach, care must be taken with the choice of bulb used. Halogen bulbs can get very hot so a compact fluorescent bulb or LED bulb should be considered as these are cooler to the touch.

3.2.9 Sufficient lux levels

Lighting levels need to be sufficient for people with dementia and sight loss to clearly see the environment and carry out specific tasks. A common measurement of light in an area is the lux level. To ensure there are sufficient levels of light within an area there are recommended lux levels for certain areas which should be adhered to when planning lighting schemes.

Further reading on Lux levels

The colour, light and contrast manual (Bright and Cook, 2010, pp85-95).

Housing for people with sight loss: A Thomas Pocklington Trust design guide (Thomas Pocklington Trust and Habinteg Housing Association, 2008).

The SLL code for lighting (CIBSE, 2012)

3.2.10 Lighting maintenance

Care Home, 2 years old

“There are a wide range of bulbs used in the building which makes it hard to replace them. Maintenance staff often fit the wrong types of bulbs in light fittings.”

Care home manager

Having a range of different types of bulbs can cause maintenance problems and fitting incorrect bulbs can undo all the work of a lighting engineer and put residents at risk. Providing a clear lighting schedule and room layouts for staff can help ensure the correct bulbs are used when bulbs are changed.

Light bulbs start to lose output after periods of time and therefore the quality of light will decrease, which could put residents with dementia and sight loss at risk if lighting is not sufficient (Pollock et al, 2008, p35). Maintenance plans should incorporate light bulb cleaning and replacement schedules. Light bulbs should be regularly cleaned and replaced when they start to lose output to ensure that lux levels within a home are maintained.

(Please refer to Light and lighting design for people with dementia, Pollock et al 2008, p35 for recommended maintenance schedules).

Extra Care home, 3 years old

“The residents can’t buy the light bulbs to fit the fittings in their flats in mainstream shops and this has caused a problem – we have had to purchase a large stock of bulbs to solve this.”

Extra Care home manager

3.2.11 Environmental sustainability and choice of bulbs

Wherever possible, energy efficient lighting should be used.

There are three main types of energy saving light bulb:

- Halogen bulbs are the cheapest energy saving light bulbs, but they are the least energy efficient and the least durable. Halogen bulbs are not sufficiently energy efficient to meet the standards within Part L building regulations or the Code for Sustainable Homes.
- Compact fluorescent lamps (CFLs) are currently the most common energy saving light bulbs. They are energy efficient and durable.
- Light emitting diode (LED) lights are the most energy efficient and the most durable, but can be the most expensive.

Halogen and LED bulbs light up immediately whereas CFL bulbs can take time to come on, and to get up to full brightness. There are some quick start CFL bulbs but others may take up to five minutes to reach full brightness. Immediate lighting is particularly important in hallways, on stairs, and in bathrooms.

Image of the evolution of lighting from the candle, to the tungsten bulb to the compact fluorescent to today's solution, the LED bulb.

Photo credit: Vladimir Gjorgiev/Shutterstock.com



The controllability of lighting is important in order for people to adapt lighting to suit their own needs. Some CFL and LED bulbs cannot be dimmed so it is essential to check this before making your choice. Where timers and light or movement sensitive (photocell) lights are required, these can be used with halogen and LED bulbs but not currently with CFL.

Lighting is such a crucial part of enabling a person with dementia and sight loss to be able to use an environment safely and efficiently, that the aim should be to achieve energy efficient lighting that also meets the needs of people with dementia and sight loss. LED lighting has the ability to meet both agendas and provide energy efficient lighting that meets the needs of people with sight loss and dementia.

Previously LED lighting only gave relatively low levels of light output, could not be offered in many colour options and many could not be dimmed. However the technology is advancing and there are many types of LED bulbs that can be used in domestic situations. Light levels have now been increased and they can now give the same and better light levels than other types of lighting such as the traditional tungsten bulb, Halogen, and compact fluorescent lighting. They are available in a range of colour options, some are dimmable and some have good colour rendering properties. Although the initial outlay for the lamps is relatively expensive compared to other types of bulbs they are very cost efficient to run and can last as long as 25 years.

Using LED lighting can meet Part L and BREEAM standards while also ensuring that lighting can meet the needs of people with sight loss and dementia.

Images of domestic type LED lighting that can replace tungsten, halogen and CFL bulbs. Photo credit: Fotokostic/Shutterstock.com



Further information on choosing light bulbs

Ricability Reports (2012) Choosing energy saving light fittings for your home.

Make the most of your sight – Improve the lighting in your home (RNIB and Thomas Pocklington Trust, 2012).

Environmental sustainability and artificial lighting

BREEAM New Construction 2011 Health and Wellbeing HEA 01 requirements:

- Hea 01 Visual Comfort – that all fluorescent and compact fluorescent lamps are fitted with high frequency ballasts which increases the rate of flicker from 50Hz to about 30,000Hz which cannot be perceived.
- Hea 01 aims to ensure best practice visual performance and comfort for building occupants. The standard recognises that for care homes housing people with dementia the following code can be used instead of the CIBSE Code for lighting: Design lighting for people with dementia, University of Stirling, Stirling, 2008. This will not necessarily meet the requirements of people with sight loss, so the recommendations in this section should also be followed.

3.2.12 Additional considerations

This section looks at:

- light switches and sockets
- sensor lighting
- night time lighting
- colour and furnishings

Light switches and sockets

There should be sufficient sockets around rooms to provide flexibility to enable task lighting to be used as and when necessary.

Light switches should be a large rocker type as these are easier to operate than standard rockers for people with limited hand dexterity. They should be located in a logical position and should contrast in colour with its background and the rocker should contrast with the backplate of the switch.



Photographs – Well contrasted rocker style light switches and sockets.

There may be instances when it would be appropriate not to contrast the switch if residents are likely to turn off the lighting which could create poorly lit areas (See Section 3.3.5).

Case study, woman with dementia living in an Extra Care home built two years ago:

Although the switches and rockers contrast, mum forgets which switch turns on which light. We added the stickers, which have helped her remember which rockers switch on which lights. **Daughter**

In residents' rooms or flats it may be necessary to adapt rockers and add different coloured stickers or tactile bump-ons to help individuals identify which switch turns on which lamp. This adaptation can be made as and when necessary to meet the needs of the individual resident.

In addition sockets with integrated lighting can support people to locate the position of the switch.

Case study, Extra Care home built 3 years ago

The blue integrated light within the light switch helps residents to locate the light switch to turn on the bathroom light in the evening.

Sensor lighting

Lighting activated by sensors is an excellent feature that can reduce electricity bills, service charges and promote environmental sustainability. When planning lighting activated by sensors, care should be taken to ensure the areas are lit immediately. Bulbs should be carefully chosen and positioned to provide sufficient immediate lux levels and an even spread of light.

Care home built 20 years ago

“The light and fan are connected in the bathroom so we are unable to leave the bathroom light on overnight.”

Care home manager

Installing a fan that is sensor activated when someone enters a bathroom could alleviate the above problem. It would then be possible to leave the light on in the bathroom at night, improving people’s independence and safety in finding the toilet.

Considerations when choosing sensor activated lighting include:

- Sensors should be positioned so that routes and areas are immediately lit with no time lag.
- Sensors should be set to people’s movement not on a timer as lighting set on a timer may go out if people walk slowly or are in a room for a long length of time.
- External lighting should be set to daylight sensors rather than timers to ensure lighting comes on as dusk starts.

Night time lighting

Lack of lighting can mean a normally continent person can experience problems managing their continence during the night, if the journey to the toilet is not made clear and easy.

To promote continence, **night time lighting** should be thought through:

- A night light left on in a bathroom that increases in lighting level when someone enters the bathroom could support continence and independence by showing people where the toilet is.
- Consider sensor lighting that is turned on when someone leaves the bed to light the way to the toilet. Note: this lighting will need to turn on gradually to avoid startling the individual while still being sufficient to light the route to the toilet.
- Using a plug-in night light could be a cost effective way of providing some light at night time if funding is unavailable to alter lighting.

Additionally colour and tonally contrasted areas in conjunction with good lighting can also promote continence in enabling someone to get to the toilet. For example:

- Toilet doors should always be highly visible with contrast and the WC visible from the bed.
- Toilet, sinks and grab rails should contrast against the wall and floor to highlight their position.
- Toilet seat should contrast against the pan to highlight the position of the pan.
- Using bed covers and a headboard that contrasts with the walls and floors can help support people locating the position of the bed and getting back into it.

Lighting in gardens is important as it will allow maximum use of garden areas. For example, the use of lighting could allow residents to make use of a garden at dusk in summer months.

Colour and furnishings

Keeping the furnishings and walls as light as possible whilst still achieving sufficient light reflectance value and differences between key surfaces and features will help ensure light is reflected back into the room.

Painting the ceiling colour white with a paint that has a high light reflectance value helps ensure that light that reaches the ceiling is directed back into the room. Both Crown and Dulux make some paints with Light Reflectance Values (LRV) of 90 and above. Alternatively, if acoustic ceiling tiles are used, select a tile with a high LRV above 80. See Section 3.3.2 for further information on Light Reflectance Values.

Further reading

Make the most of your sight – Improve the lighting in your home (RNIB and Thomas Pocklington Trust, 2012)

Good housing design lighting – A guide to improving lighting in existing Homes (Thomas Pocklington Trust, 2010).

The colour, light and contrast manual (Bright and Cook, 2010)

Designing lighting for people with dementia (Pollock et al, 2008).

Dementia Services Development Centre Virtual Care Home

<http://dementia.stir.ac.uk/virtualhome>

3.3 Colour: using contrast

This section looks at:

3.3.1 The importance of good colour and tonal contrast

3.3.2 Achieving effective colour and tonal contrast

3.3.3 Using colour and tonal contrast to highlight specific areas

3.3.4 Using colour and tonal contrast to highlight potential obstructions

3.3.5 Reverse colour contrasting

3.3.6 Additional considerations

- Surface finishes
- The effect lighting has on colour
- Colour and wayfinding
- Colour to increase food intake.

3.3.1 The importance of good colour and tonal contrast

One of the major changes in vision caused by many forms of dementia and sight loss is a loss of colour vision. A well-contrasted environment can help maximise vision and make the difference between seeing and not seeing the environment and key features within it. When planning a well-contrasted environment consideration should also be given to ensuring that the chosen colours promote wellbeing within an environment. The promotion of wellbeing through colour schemes is discussed in section 3.4.

Poor colour contrast, particularly with inappropriate lighting (see sections 3.1 and 3.2), can prevent an individual from functioning safely and independently. An example of this is frequently seen in bathrooms where the toilet, toilet seat, cistern, bath, sink, grab rails, toilet paper, towels etc are often white, in a room tiled with shiny white tiles, with a white ceiling and door. Such an environment can make it difficult for individuals who have a loss of colour vision to find items in the bathroom that are essential to maintain independence.

Photograph – Bathroom in a sheltered housing site with no contrast. Lack of contrast in a bathroom can make it difficult for people to see the toilet, sink, bath, toilet paper, hand drier and grab rails against walls.



Good use of colour, tone and contrast in bathrooms. Walls and floor contrasting against each other, sanitary ware colour and tonally contrasted against the floor and wall. Grab rails highlighted against the walls and floor and the position of the toilet seat clearly highlighted against the pan.

Photograph courtesy of Linc Cymru.



Colour and tonal contrast should be used throughout the home alongside good lighting to:

- Emphasise the size and shapes of rooms by highlighting the difference between the walls, floor and ceiling; and routes by contrasting walk ways against surrounding surfaces.
- Highlight key features – for example the difference between the worktop and floor, door against the wall.
- Highlight furniture – for example the position of chairs and tables against walls and floors.
- Highlight key safety features such as nosing on stairs, grab rail against wall, handrail against wall.
- Switches and controls – such as sockets and switches, lift buttons, heating controls.
- Promote food intake – for example by contrasting food against plate and liquid against cups, using cutlery with coloured handles that contrast against the table to highlight their position.
- Promote sleeping – using colour and tonally contrasted bed covers and a headboard that contrasts with the walls and floors can help people to locate the bed and getting back into bed.
- Promote continence and independence for people using bathrooms – colour contrasted toilet seats and sanitary ware can help people locate items within the bathroom.



Good use of colour and tonal contrast on walls, floor, ceilings and furnishings help highlight the size and shape of the room, position of tables and chairs. A choice of dark coloured table mats help highlight the position of light coloured crockery.

Photograph courtesy of Linc Cymru

Good use of colour and tonally contrasted furniture in a communal dining room highlights the position of chairs and tables against surrounding surfaces. The signage on the door is well contrasted against the door.

Photograph courtesy of RCT Homes



3.3.2 Achieving effective colour and tonal contrast

Effective colour contrast is determined by the difference between the Light Reflectance Values (LRVs) of adjacent critical coloured surfaces.

Different terms used in technical documents that have referred to colour contrast have led to confusion over the exact nature of colour contrast itself.

For example, Approved Document Part M (HM Government, 2010 and 2013) uses the terms “contrasting visually” and “visual perception”. BS8300 (BSI, 2010) uses the term LRV on occasion and on others the terms “visual contrast” or “contrasting colours”, while to many designers the term “contrasting colour scheme” means a colour scheme with a strong accent colour.

The issue of effective colour contrast is more than whether something is a contrasting colour in the usual sense of the word.

People with sight loss often have a loss of some colour vision, while others may have colour deficiencies. Therefore we cannot rely on the perception of a difference in colour as a means of determining effective colour contrast, for example red against blue (two different hues).

“For most people with adequate vision, difference in hue (the nature of the colour) or chroma (the intensity of the colour) provide adequate visual contrast. The main feature of a surface which appears to be strongly correlated with the ability of visually impaired people to identify differences in colour is, the amount of light the surface reflects, or its light reflectance value (LRV).”

BS8300 (BSI, 2010).

Light reflectance value

Some manufacturers have names and codes for the colours and products they make. These names and codes are not standard, and may be specific to that manufacturer or sector. Other manufacturers refer to colour standards such as BS4800, NCS-Natural Colour System®©, Munsell or RAL to communicate their colour product ranges. All colours have a Light Reflectance Value (LRV) which is a separate notation.

LRV is expressed on a scale from 0 to 100 where zero is a perfect black and 100 is a perfect white. In practice however black may have an LRV reading of about 6 and white about 85.

LRV is the term used to describe the proportion of visible light reflected by a surface, weighted for the sensitivity to light of the human eye. It is measured with a spectrophotometer under specific conditions recognised internationally by the CIE (Commission Internationale d'Eclairage). The spectrophotometer measures several values including CIE Y and CIE L*. Light Reflectance Value is CIE Y, and should not be confused with CIE L* (Lightness). These two measurements give very different values. The CIE L* measurement should not be used.

As effective colour contrast is determined by assessing the LRV of two adjacent surfaces it is essential at the planning stage to know how much of a difference is needed. Approved Document Part M 2004 states that effective "colour contrast is achieved if the difference in light reflectance values between two adjacent surfaces is greater than 30 points". This is based on lux levels not being less than 100 lux at the point where the contrast is viewed.

BS 8300 (BSI, 2010) and Approved Document M (HM Government 2013) recognises that the difference in two adjacent surfaces should be 30 points but acknowledges where there are lux levels around 200 lux there is evidence that a 20 point difference will be acceptable. BS8300 and Approved Document M (HM Government, 2013) also draw on further research that looks at the role that shape and form can have in highlighting differences.

As lighting levels cannot be guaranteed within the built environment at all times, RNIB recommends that achieving the standard of "30 points" difference is best practice. This helps ensure if lighting fails, is switched off, or if levels are insufficient that areas will still be contrasted sufficiently. In practice, when creating attractive environments this is sometimes problematic. If this cannot be achieved, then it is better to get as close to 30 points difference as possible, while also achieving an attractive environment. It is likely that a difference in excess of 20 points will give adequate contrast in most light conditions, while a difference in excess of 30 points is likely to give adequate contrast in all light conditions.

Determining light reflectance value

Light Reflectance Values are precise readings and cannot be guessed at.

There are four practical ways of determining LRV:

1. measurement by a laboratory
2. contact the manufacturer
3. reference to standards with known LRVs
4. visually matching the colour to one whose LRV is known.

For further information please see Colour and Tonal Contrast: RNIB Cymru/John (2007)

Please also refer to BS8493: 2008 Light Reflectance Values: Method of Test. British Standards (BSI) (2008).

Critical surfaces and key features

Effectively colour contrasting an environment involves ensuring a 30 point difference between critical surfaces and key features (see light reflectance value section above). Determining critical surfaces and features involves understanding how people will use an environment and levels of functionality.

1. **Large critical features** are doors, ceilings, walls and floors. These features help with navigating through a space.
2. **Medium sized critical features** are, for example, architraves, bath panels, cupboard doors and kitchen surfaces. These features help in determining size and shape.
3. **Smaller significant features** include grab rails, light switches, door, drawer and cupboard handles.

For larger surfaces, there should be 30 points difference between:

- the ceiling and the walls
- the walls and the floor
- doors should be contrasted from the surrounding walls and the leading edge should be contrasted from the rest of the door.

For medium and smaller features there must be a sufficient colour contrast between:

- cupboard door and wall
- work surface and floor
- switches and sockets and their background
- cupboard handles and their background
- door furniture and the door itself
- grab rails and the wall
- the leading edge of the screen and the shower screen
- sanitary ware to wall and floor
- grab rail and the wall
- handrails and the wall
- stair nosing to carpet.

(RNIB Cymru/John, 2007, p27; WG, 2005; BSI, 2010)

3.3.3 Using colour and tonal contrast to highlight specific areas

Doors

Consider the following when **contrasting doors**:

- Using architrave that contrasts between the door and the wall
- Contrasting the door surface against the wall surface
- The handle and door furniture should contrast sufficiently with the door for ease of identification
- The leading edge of the door should contrast against the face of the door.

Leading edge of doors contrasted against the face of the doors.

Photographs courtesy of Linc Cymru



Kitchens

Key adjacent areas to consider when contrasting kitchens:

- handles to unit
- sockets to tiles
- worktop to floor
- worktop to units/tiles
- tiles to wall units
- units to floor.

The units contrast with the worktop and tiles, the band of tiles highlight the position of the sockets.

Photograph courtesy of United Welsh Housing Association



Key adjacent surfaces highlighted using colour and tonal contrast.

Photograph courtesy of Linc Cymru



The units contrast with the worktop and tiles. The worktop is highlighted against the floor and a black plinth has been used to highlight the position of the units against the floor. The sockets are contrasted against the tiles and the handles are contrasted against the units.

Photograph courtesy of RNIB Cymru



Bathrooms

Key adjacent areas to consider when **contrasting bathrooms**:

- wall to floor
- ceiling and wall in large bathrooms
- sink and toilet to wall
- sink and toilet to floor
- shower controls and shower head to wall
- toilet paper/toilet dispenser
- hand drier to wall
- soap dispenser to wall.

Assisted bathroom with matt tiles and position of bath highlighted using a contrasting tile. The housing association has added a chair and co-ordinating towels and accessories to give the bathroom a homely feel.

Photograph courtesy of
Tai Clwyd



Stairs

Key surfaces to consider when **contrasting stairs**:

- stair surfaces should contrast against the wall
- walls should contrast with the ceiling at the top of the stairs
- handrail should contrast against the wall
- nosing should contrast against both the tread and the riser.

Edge of steps on stairs highlighted by contrasting nosings and handrail highlighted by a colour that clearly contrasts with the wall. The colour contrasted nosing that wraps around both the tread and the riser of the step is an excellent feature that clearly highlights the position of the edge of the step against the carpet. This assists people in locating the edge of the steps when going up and down the stairs.



Photograph courtesy of United Welsh Housing Association

Lifts

Key areas to consider when contrasting lifts:

- lift car door should contrast against the wall
- walls of the lift car should contrast with the floor
- RNIB recommends a lift floor colour that is higher than 20 LRV. Below 20 LRV results in a dark floor that could be perceived by someone who has dementia and sight loss as an open lift shaft or a hole.
- control panel should contrast against the walls both internally and externally
- lift buttons, numbers and writing should contrast against the control panel.

A lift floor and wall that has been colour and tonally contrasted.

Photograph courtesy of RNIB Cymru



The lift incorporates a wheelchair accessible control panel.



The control panels have tactile numbers and braille.

Photographs courtesy of United Welsh Housing Association



Bedrooms

Choosing bedding and furniture that contrasts against the flooring and walls makes it easier to see the edge of a chair or bed and also highlights the position of furniture at night time when light levels are low.

3.3.4 Using colour and tonal contrast to highlight potential obstructions

Any obstructions or hazards should be removed to ensure they are out of walkway routes. If this is not feasible they should be highlighted appropriately, for example by using tactile flooring, and colour and tonal contrast. Any dangerous elements such as sharp corners should be covered.

For blind and partially sighted people hazards can be highlighted by the presence of warnings that can be detected during the sweep of a cane and a tactile change in the floor surface that can be detected underfoot. In the absence of projections and overhangs which cannot be detected at ground level a good colour and tonal contrast with the background will reduce the risk of colliding with items located along an access route. Colour and tonal contrast must be effective when viewed from any direction from which the item may be approached.

The following issues should be considered to remove or highlight potential obstructions:

- Highlight all potential obstructions or hazards by ensuring they contrast against their background when viewed from all directions.
- Ensure all routes are free of potential obstructions where feasible.
- Highlight a column or pillar by incorporating a contrasting band 150mm deep with the bottom edge 1500mm from the ground.
- Low objects such as bins and plant pots should be placed 1000mm high with a contrast band 150mm deep at the top.
- Provide hazard protection, where an object projects into an access route or walkway and the lower front edge is more than 300mm above the floor, by visual contrast and a tapping rail, with its underside no higher than 150mm above floor level.
- Provide manifestations on glazed doors and screens.
- Contrast the leading edge of doors including glazed doors so they are visible when open.

3.3.5 Reverse colour contrasting

Reverse colour contrasting or camouflaging areas and de-emphasising extraneous detail is a concept that can be adopted in appropriate situations where necessary to reduce risks and reduce frustration for some people with dementia (Spears, undated). For example, a person with dementia may continually try to open a locked door which could cause them distress. The concept involves keeping things all one colour/tone with their surroundings rather than highlighting them through colour and tonal contrast.

Camouflaging of areas is more likely to be an appropriate option in care homes for people with dementia/or care homes with dementia wings where people are likely to have more advanced dementia. However it is a strategy that can be borne in mind and introduced in an Extra Care home/sheltered housing complex where appropriate.

Please note: There are ethical issues surrounding the use of this method and much care will be needed when deciding if it is appropriate to camouflage an area (Goodman and Watson, 2010a). In each situation the need to reduce frustration for individuals with dementia/or the need to stop someone undertaking an action will need to be balanced against other residents and staff who may have sight loss. In a care home or Extra Care home people are likely to have a range of needs, eg, some people who have sight loss but do not have dementia may wish to use exits and camouflaging areas could restrict their independence.

Camouflaging fire exits from corridors or someone's front door in a person's own home would need to be balanced with the need to highlight exits for everyone in the event of a fire.

Camouflaging staff doors could make it difficult for blind and partially sighted staff to find their way to staff areas. Where this situation does arise the housing/care home provider will have to balance the individual needs of staff against the needs of the residents.

In some cases camouflaging controls may be considered in order that heating, lights or fridges for example are not turned off by someone with dementia. While this may prevent someone with dementia carrying out this action it would not be appropriate for someone with sight loss who did not have dementia as it could reduce their independence (Goodman and Watson, 2010a). Where this situation arises the housing or care home provider will have to think carefully whether camouflaging is appropriate and ethical.

The following examples may be appropriate in certain situations:

- A person with dementia may continually switch off a highlighted colour and tonally contrasted light switch and put themselves and others at risk by reducing lighting levels. By camouflaging the switch and using a switch that is in the same colour/ tone as the wall surface this problem may be alleviated. This may not always be an appropriate option, as walking at night is common in individuals with dementia and masking the position of the light switch could put people at risk.
- Camouflaging a locked exit from a garden may alleviate distress and confusion by people with dementia continually trying to open a locked gate.
- Camouflaging areas can enhance key features in communal areas such as hallways. For example camouflaging staff and utility area doorways while highlighting the toilet door can help ensure that in a corridor with a number of doorways the toilet door is clearly highlighted. Handrails fitted across doors that are not meant to be accessed could further camouflage areas and ensure continual support for residents (Pollock, 2007, p16).
- Camouflaging lockable drawers and cupboards such as a medicine cupboard could help take the attention away from areas that are necessary but could be dangerous for some people to access.

Case study, Mrs S, aged 75 who has dementia

Mrs S who lived in a nursing home was constantly attracted to a large locked fully glazed window at the end of the corridor. The fact that she could not get outside caused her much anxiety and distress. The care manager was considering placing a roller blind on the window to alleviate the lady's distress. Using a blind in this instance would be appropriate as it offers flexibility and enables other residents to take in the views outside.



Note: In the above example the fully glazed window may not be detected by someone with sight loss and dementia, who may mistake it as an opening, making it a potential collision hazard. Please see section 3.1.3 on glazing for further information.

Photograph – Camouflaged doors painted in same colour as wall to mask doors to service area (electrics) in a care home. Clearly contrasting handrail continued in front of door to further disguise door and continue support for residents. The handrail is warm to touch and round, with no open ends which are good features. In this situation camouflaging a door worked well as it helped ensure that other clearly contrasted doors, such as toilets and lounge doors, could be clearly seen.



Photograph courtesy of Hafod Care

For advice on handrail design please see BS8300 (BSI, 2010)

3.3.6 Additional considerations

This section looks at:

- surface finishes
- the effect lighting has on colour
- colour and wayfinding
- colour to increase food intake.

Surface finishes

When planning colour schemes, surface finishes and patterns must be considered carefully at the design stage. Satin or matt finishes are preferable to high gloss, which can cause confusing reflections, and reflect bright light around a room. Patterned and striped surfaces are often preferred by designers for aesthetic appeal; however large patterns/striped surfaces can cause confusion. For further information on surface finishes please see design guidance – Section 3.5.

The use of textured fabrics, wallpapers and wallcoverings should be considered to provide tactile feedback, support wayfinding, and provide interest within an interior design scheme. For further information on wayfinding please see design guidance – Section 3.8

The effect lighting has on colour

Lighting is a key factor when choosing colours as different types of light bulbs can greatly affect the appearance of colours. Therefore a colour scheme that works well and is harmonious in a design studio may not work well on site due to the effect of different lighting.

Different types of lighting can have different effects on colours. For example incandescent and warm white fluorescent bulbs “intensify warm colours and neutralise cool colours” (Calkins, 2002, p21). Cool white fluorescent bulbs intensify cooler colours such as green and blue.

When selecting colours it is always best to do this in conjunction with planning lighting schemes or on site if the lighting is already in-situ. Obviously this is a more difficult process if the lighting is not in-situ but it is well worth setting up an area in an office to test colours using portable light fittings with bulbs that are intended to be used on the scheme. This gives designers an idea of the effect the lighting is likely to have on a planned colour scheme and enables the designer to make any changes if necessary.

If light fittings and bulbs are yet to be specified it is advisable to use lamps that give a light close to daylight in order that the true colours are seen and not affected by light bulbs. Ensuring the bulb has a colour rendering index of 80 to 90 for general lighting and 60 for lamps will help colours appear close to daylight (Pollock et al, 2008, p27). For further information on lighting please see Section 3.2.

Colour and wayfinding

Colour can be a good way to provide a theme for a room or corridor in order to support wayfinding. However it should not be used on its own as a wayfinding tool as it cannot be guaranteed that people with dementia, who may also have sight loss, will be able to determine individual colours (Bright and Cook, 2010, p121). Instead colour should be used with other wayfinding tools and locational markers to support as many people as possible in wayfinding and orientation (Calkins, 2002). See Section 3.8 for more on wayfinding and Section 3.9 about signage.

In our research some people had lost the ability to name colours, and some could not determine colours so the colours did not support them wayfinding. Whereas others knew they were on the correct corridor and where their flat was situated due to the corridor colour and the shade of paint that highlighted their door.

In one care home the toilet doors were all painted yellow. This helped some residents to locate the toilets but others could not. When asked to locate the yellow door some residents needed further support such as signage and symbols to locate the toilet door in the communal corridor.

Photograph – doors to toilets were painted yellow in a contrasting colour to the wall to support wayfinding. The door handle clearly contrasts against the door to highlight its position. Doors outside the residents' corridors had small signs placed on them but the doors in the communal corridors did not. These could have benefited from improved signage to further support wayfinding.

Photograph courtesy of Hafod Care



Colour to increase food intake

People who have a decline in contrast sensitivity due to sight loss and/or dementia may find it difficult to locate a plate on a table, food on a plate or liquid in a container, for example mashed potato on a white plate. Providing visual contrast of crockery against tables and foods and liquids against crockery can enhance food and liquid intake (Dunne et al, 2003 p534).

When purchasing crockery it is advisable to consider what foods are likely to be served and to purchase a range of different coloured crockery to ensure that food can be seen clearly against the plate. Cutlery with handles that contrast against crockery and table cloths can also be purchased to help residents locate their position on a table.

For some people with dementia crockery in very bright primary colours such as red or yellow may help promote food intake. This should be done in conjunction with ensuring the crockery and food items contrasts against their background in terms of colour and tonal contrast.

In kitchen areas contrasting storage jars can be purchased to highlight the position of tea, coffee and so on.

Existing crockery can be highlighted by purchasing contrasting table cloths, table mats and coasters.

If photographs of food are used in addition to a written menu, it is advisable that food is clearly contrasted against the plate to enable as many people as possible to identify the food on the menu.

Colour contrasted dining room. Tables and chairs contrasting against surrounding material.



Dark mat used to highlight position of plate against table.

Photographs courtesy of Linc Cymru



“We have purchased a range of crockery to ensure foods can contrast against plates. We have given all our kitchen staff sight loss awareness training to ensure when they serve foods that they use crockery that contrasts against the colours of the food. This helps our residents who have sight loss and/or dementia in independently eating and drinking”

Extra Care Scheme Manager

“One of our residents was not drinking enough water and was dehydrated – we coloured the water with blackcurrant squash when she used a glass and her fluid intake has increased”

Nursing Home Manager

“Following on from our dementia and sight loss awareness training we have asked our cook to reproduce the photographs of foods that will be listed on the menu to ensure they are contrasted against the plate in order that residents can see items clearly on the menu.”

Nursing Home Manager

Further reading

Colour and tonal contrast (RNIB Cymru/John, 2007)

The colour, light and contrast manual: Designing and managing inclusive built environments (Bright and Cook, 2010)

3.4 Colour: creating schemes

This section looks at

3.4.1 The effects of colour on mood, physiological effects of colour and colour associations

3.4.2 Creating a harmonious scheme.

3.4.1 The effects of colour on mood, physiological effects of colour and colour association

Colour can be used to improve an environment and contribute to people's wellbeing. Colour can affect people's moods and can also have physiological effects; so consideration needs to be given to the space and the type of feeling or experience you want to create for the building's users.

There has been lots of advice about the use of colour for people with dementia but little is based on empirical evidence (Dalke et al, p169, 2011; Calkins, 2002). There is a need for further research in this area based on how colour is applied in the home environment to try to understand how people with dementia respond to colour and which if any they prefer.

For the present it is appropriate to use the same rules regarding colour and the effects that colour can have on people that can be applied to the general population (Calkins, 2002, p22). This should be done in conjunction with ensuring features are highlighted, using different colours or tones with sufficient Light Reflectance Value difference (section 3.3.2) to ensure that someone with a loss of a colour vision can determine the key features of an area (Calkins, 2002; Bright and Cook, 2010, p121).

The effects of colour on mood

Different shades/tints of lightness or darkness (value) of the same colour (hue) can provoke different feelings and research should be done on a colour palette before putting it in place to ensure that the particular shade or tint of colours (chroma) will provide a positive atmosphere within an area (see general guidelines on colour below).

Physiological effects of colour

Some colours can have a positive or negative physiological effect on people when they enter a room (see general guidelines on colour below for further

information). If someone is in the room for many hours, the effect may wear off. The effect of colour on the body will have more significance if an individual visits the area rather than stays in it for many hours.

Colour association

Below are some general guidelines to use as an introduction to thinking about how to use colours.

Colours are often referred to as being warm or cool. For example, greens, blues and purples are cool colours and reds, browns, oranges and yellows are warm colours.

Blue – certain lighter and mid shades of blue can have a calming effect on people when applied in a room. Too much blue or darker shades of blue may be seen as providing a depressing atmosphere.

Blue is thought to depress appetites so should not be used in a dining room. Blue can make a room appear larger than it is and can make a room feel several degrees cooler.

Case study on blue:

Some people in our research did not like walking on a dark blue floor as they feared it was water. Others found a corridor that had different shades of blue cold and uninviting.

Green – can reduce central nervous system activity and is one of the most calming colours to use in an area and can make a room appear larger. Bright shades of green can help foster a lively atmosphere. Darker shades of green can have the opposite effect and create rooms that are not relaxing to be in.

Yellow - yellows can be associated with joy and happiness. Bright yellow can be associated with danger and cause friction as it is often used to highlight hazards. Yellow can stimulate the brain and make people alert.

Case study on green and yellow:

In our research the residents loved the bright yellow and greens used in a sunroom that was on the second floor of the Extra Care home. It produced an energising room that was used by residents as a secondary seating area for gatherings and parties.

Orange – can be seen as a warm, earthy colour. Bright shades of orange can bring an energising effect to a room but certain shades or too much orange may produce a room that is not pleasant to sit in. Orange is an appetite stimulant and aids digestion so may be appropriate in a dining room.

Red – can be viewed as an exciting, energising colour but also as a violent and aggressive colour which can increase brain wave activity and stimulate the production of adrenalin. Red can decrease the apparent size of the room and increase the apparent temperature of a room (Calkins, 2002, p21).

Pink – may be seen as a romantic, cosy colour but to others may be seen as sickly and gaudy. Pink can induce feelings of calm and protection and in some cases lessen irritation and aggression.

Purple – can be seen as a sensual, sophisticated, dignified and rich colour. Lighter colours such as lavender can be seen as more romantic colours. Violet can suppress hunger and balance the body's metabolism.

Brown – shades of brown can produce a room that is earthy, warm and rustic. Darker browns can be seen as appetising and rich. Some shades can be seen as bland.

White – can be seen as a pure, innocent, fresh colour but to others may be seen as stark and boring.

Grey – can be seen as a classic, steadfast colour with timeless qualities but can also be seen as depressing.

Cream – can be seen as a classic neutral colour but can also be seen to some as bland.

Black – may be seen as a stylish and modern colour but to others may be seen as depressing.

(Sources: Eiseman: 2006; Bonewitz, 2000; Stone et al, 2006; Calkins, 2002)

The use of primary colours

The primary colours red, yellow and blue are sometimes used in dementia care settings. They have been shown to have a positive effect and improve continence when used for toilet seats and toilet doors. The use of primary colours for crockery has been shown to increase food intake. However a scheme that uses a great deal of primary colours can produce a garish colour scheme that some people with dementia and sight loss may find over stimulating and tiring (Perkins et al, 2004; Alzheimer's Association, Australia, 2000). It is therefore better to use these primary colours as accents when necessary to promote continence, eating and drinking rather than producing a scheme that is full of primary colours.

Further research needs to be carried out in this area to determine if the use of primary colours to promote independence such as toileting and eating promotes a higher level of independence than the use of a strong, but calming colour that has Light Reflectance Value of 30 or above with surrounding surfaces.

Culture and personal preference

Colours can have positive and negative connotations for certain cultures. Therefore consideration will need to be given to who will be using the building. For example, the following colours are seen by different cultures as colours of mourning:

- red – Africa
- blue – Iran
- yellow – Egypt.

In Japan and China white is considered a funeral colour and in Latin America purple indicates death (Stone et al, 2006).

People also have personal preferences for colour and where possible colour should be planned with individuals in mind or in consultation with individuals.

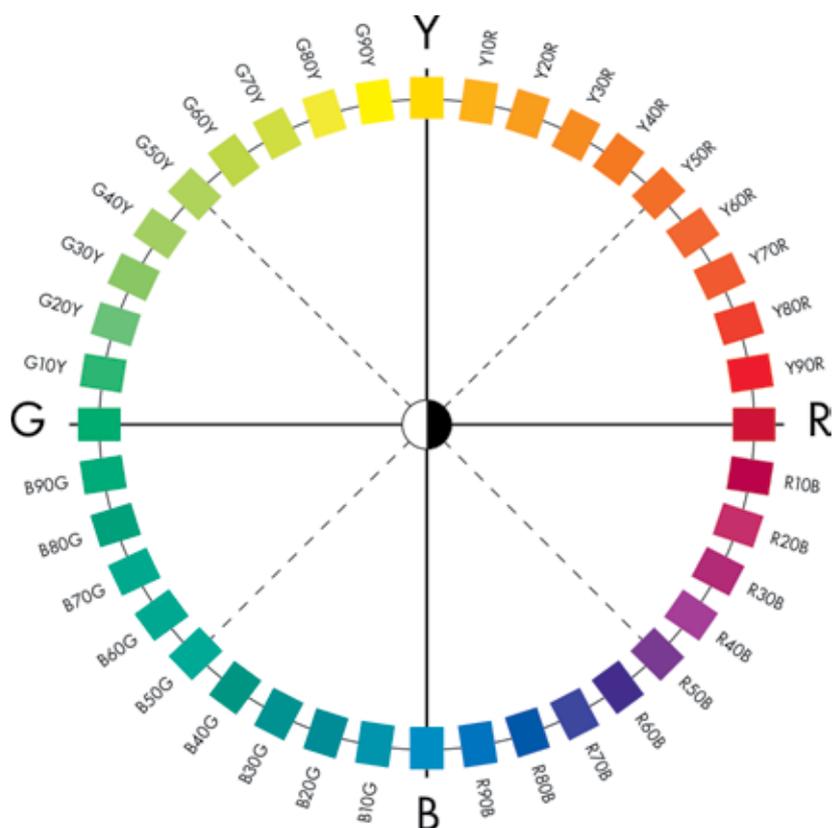
Colours may need to be changed in a scheme at a later date if necessary to fit in with cultural and personal preferences as new residents move in.

3.4.2 Creating a harmonious scheme

There are a number of ways of putting together a harmonious colour scheme such as using colour wheels and copying a combination that works.

Using a colour wheel

Using a colour wheel can help when planning colour schemes and create harmonious schemes that work well together.



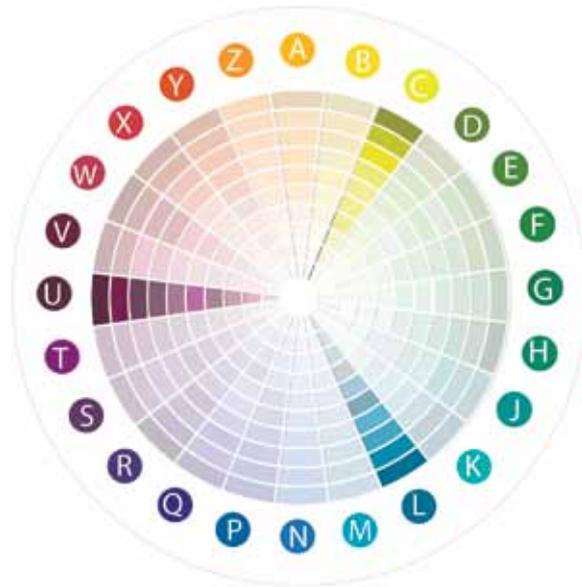
Monochromatic/tonal colour scheme – using colours that are different shades and tints of a single colour. This scheme uses colours from the same 'hue' but which vary in saturation and lightness. The monochromatic scheme is very easy on the eyes, and can produce a calming and soothing effect especially with blue or green hues.



Contrasting scheme – using shades that are opposite each other on the colour wheel. Equal amounts of the colour should not be used as they can produce a scheme that is too vibrant and clashes which may not produce a relaxing home environment. It is better to have one main colour and use the other colour for an accent wall or to pick out smaller features such as cushions, table mats and so on.



Triadic scheme – Using colours that are spaced evenly around the colour wheel can help create a harmonious scheme. As above it would be appropriate to use one main colour and bring in the two other colours as accent colours.



Analogous/harmonious scheme – The analogous colour scheme uses colours that are adjacent to each other on the colour wheel.

One colour is used as a dominant colour while others are used to enliven the scheme.



Images and text courtesy of Crown Paints

Copy a combination that works well

Taking inspiration from a painting, an image or nature with a series of colours that work well together can be another way of pulling out colours to create an harmonious scheme.



The designer is using paintings and images as inspiration to develop two sets of colour palettes that work well together. This has been done in combination with colours having a range of LRVs to ensure key features can be picked out.

Further reading

Colour: A workshop for artists and designers (Hornung, 2005)

Colour, environment and human response: an interdisciplinary understanding of color and its use as a beneficial element (Manke, 1996)

Color: messages and meanings (Eiseman, 2006)

Color design workbook (Stone et al, 2006)

3.5 Surfaces

This section considers the impact of:

3.5.1 Patterns

3.5.2 Finishes

3.5.3 Change in surface

3.5.4 Acoustic and frictional qualities

3.5.5 Thresholds

3.5.6 Changes in levels.

When choosing products, fixtures and fittings, and putting together specifications, care should be taken to ensure surfaces do not cause difficulties for individuals with dementia and sight loss. Surfaces used should be safe, easy to clean and anti-slip even when wet.

3.5.1 Patterns

Busy and geometric patterns can cause confusion, distraction, and affect how someone uses a space and hinder wayfinding for people with sight loss and dementia.

For example:

- Some individuals will find it very difficult to walk on patterned or striped flooring. A busy floor surface can lead to someone falling or stumbling.
- Speckled worktops in kitchens can make it difficult for some individuals to locate items on a work surface.

This does not mean the environment has to be plain and uninteresting. The use of fabrics and wall coverings with varying textures and tonal changes can help create interesting interior design schemes (Calkins, 2002, p22).

Patterns with subtle colour changes are acceptable. Care should be taken that the colour changes are subtle and that the colours within the pattern have a difference of less than 20 Light Reflectance Value points if lighting is 100 lux and 15 points if lighting reaches 200 lux, which are below the minimum levels at which contrast is discerned (Bright and Cook, 2010, p136). However as lux levels can sometimes vary due to bulbs failing or losing output over time it is recommended that using colours with 15 light

reflectance value points difference would be the better option to help ensure that a patterned surface will not cause problems for someone with dementia and sight loss. For example, using different tones in patterns with similar light reflectance value points would provide a more subtle option. Section 3.3.2 explains more about colour contrast.

Caution:

- Patterned carpets may cause confusion as they may be seen as a change in level or steps.
- Carpet tiles can cause geometrical patterns which could cause confusion to some individuals.
- Strong contrasting borders that cross over entrances to rooms may be seen by some individuals as steps.
- Patterns on flooring, furnishings, and wallpaper can be perceived as, frightening or threatening obstacles.
- Avoid bold patterns.
- If in doubt, it is best to avoid a patterned surface and select a different finish rather than building in a potential problem.
- Avoid patterned or speckled worktops in kitchens as individuals may not be able to find items on the surfaces.
- Avoid stripes on floors as they could be seen as a series of steps.
- Where possible service areas should be out of the main line of travel.

Case study, Care home built 2 years ago

Mrs S, aged 70 who has macular degeneration and Alzheimer's disease

Mrs S has a bold flowery patterned bedspread that was provided by the care home. She could not find anything such as glasses and remote controls when placed on top of her bedspread. Her daughter resolved this by placing a plain piece of material across her bedspread to enable her to locate items. Replacing the bedspread with a plain design would further alleviate the problem.

3.5.2 Finishes

Shiny and gloss surface finishes should be avoided as they can be a source of glare and reflections and cause confusion for people with sight loss and dementia. The use of matt or mid-sheen surface finishes will minimise risk.

For example, using a range of different materials such as wood rather than using glossy surfaces can help ensure areas are interesting but will not cause problems for individuals with dementia and sight loss.

3.5.3 Change in surface

Design guidance for dementia states that floor finishes should be consistent in texture and colour throughout communal areas and throughout private domestic areas. A sudden change in contrast at floor level can be perceived as a barrier or “cliffing” to some people with dementia, and may discourage movement. [Note: one guidance source actually recommends dark contrasting thresholds at certain doorways to deter people from entering the room, if need be].

For people with sight loss the use of tonal contrast and/or change of texture on floor finishes can assist determination of location, definition of areas, and help locate particular features, such as the location of lifts or stairs. This needs to be considered carefully, paying attention to the guidance in the section below about changes in floor surfaces.

Strong changes in flooring surfaces increase visual-spatial difficulties that cause people to avoid areas, step or jump over areas. Carpet rods, changes in colour of surfaces, threshold strips, dark contrasting borders and manholes can cause individuals to think there is a change in level, step or hole which can lead to falls and other accidents.

Any slight change in surface such as carpet rods, outline of service areas, manholes should be in the same colour as the surrounding area to prevent confusion.

Case study

Mrs S, aged 70 who has macular degeneration and Alzheimer's disease

Mrs S did not like crossing over the service area on the carpet flooring despite the fact that the service area was covered in the same carpet.

Each time she used the corridor she hesitated and walked around the area as she could see the metal surround of the service area.

Advice on changes in flooring surface

For people with dementia who may also have sight loss, where possible changes in flooring surfaces should have a similar frictional characteristics and should be in similar colours and have similar light reflectance values.

It is acceptable to have colour changes at doorways or at transitions between rooms. It should however be borne in mind that changes in flooring over 15-20 LRV points could cause problems for some people with dementia and sight loss who may see the change in surface as a step (Bright and Cook, 2010, p135).

Changes in flooring should have 20 LRV points difference or less where lighting is 100 lux and 15 LRV points or less where lighting is 200 lux.

Lux levels can sometimes vary over time due to bulbs failing or loss of output. When using different flooring surfaces it is recommended to use surfaces with 15 LRV points difference or less to help ensure that a change in surface will not cause a problem for someone with dementia who may also have sight loss.

If there is a change in surfaces over 15-20 LRV points difference (depending on lighting) handrails should be offered to assist people making the transition (Calkins, M, 2002, p22). Section 3.3 explains more about contrast.

3.5.4 Acoustic and frictional qualities

Different flooring emits different sounds when walked on. The different acoustics assists some blind and partially sighted individuals in the identification of rooms, orientation, and navigation and positioning of others when they are in the room.

Changes in floor surfaces that have different friction coefficients can cause people to stumble, fall or lose balance. Care must be taken that surfaces abutting each other have similar frictional characteristics. If surrounding surfaces do not have similar frictional characteristics, the two surfaces should contrast visually to highlight the change in surface and reduce the potential for an incident (BSI, 2010, p195). That is, the two surfaces should have Light Reflectance Values that are different by 30 or more (see section 3.3). This highlights the change in surface and reduces the potential for a slip, trip or fall.

While the above recommendation supports most individuals by highlighting the change in surface, it may cause problems for other individuals with dementia who may also have sight loss who may find the change in surface difficult to interpret and see the change in surface as a step. For this reason, handrails should also be provided for support and carers should be made aware that such areas could cause difficulties for some individuals.



Manholes can be perceived as obstructions or holes. A manhole cover in the same material as the paving slab would be preferable.

This manhole cover in the picture on the right has been covered using the same material as the surrounding surface. This is a good feature. The metal surround can still be seen and this could cause a problem for some people with dementia and sight loss.

3.5.5 Thresholds

Unless suitably designed the entrance into buildings can often be a barrier to access for people with dementia and sight loss. We recommend level thresholds at entrances. This helps people with dementia and sight loss, as well as wheelchair users negotiate entrances (RNIB, 2003, p43).



Threshold strips at entrances to buildings can often be trip hazards. They can also cause a visual barrier for people with dementia and sight loss and some individuals may not wish to cross over threshold strips. In new buildings and when refurbishing or maintaining housing we recommend level thresholds in accordance with the recommendations within Part M and BS8300 (BSI, 2010).

Part M Building Regulations recommend that thresholds should be level or, if this is unavoidable, they should have an up-stand height of up to 15mm. If raised, the threshold should have as few up-stands and slopes as practicable. Any up-stand more than 5mm high should have exposed edges chamfered or pencil rounded (BSI, 2010). Where raised thresholds are in accordance with the above recommendations ensuring they are the same colour as the surrounding area would help prevent a threshold strip becoming a visual barrier.

Where thresholds cannot meet this standard in an existing building they have the potential to cause a trip or fall. These areas should be highlighted in a contrasting colour to the surrounding area of 30 points or more to highlight the potential hazard (see section 3.3 Colour: using contrast). However some people with dementia could find the highlighted area a visual barrier. For the majority of users however, they are necessary to highlight the potential trip hazard.

3.5.6 Changes in levels

Changes in levels such as steps, ramps and pedestrian crossing points should be highlighted by clearly contrasting surfaces. Where appropriate, tactile surfaces should be used in line with the guidance for pedestrian crossing points and external steps.

Caution: When using tactile flooring to highlight the position of external steps “the friction coefficient of the corduroy surface should be a ‘similar friction coefficient’ to the surrounding surfaces to reduce the potential for stumbling or falling” (Alderson, 2010, p38). Generally, tactile flooring at the top and bottom of internal stairs is not recommended as it can be difficult to source a tactile corduroy surface that has similar frictional characteristic to internal flooring surfaces.

It must be noted that tactile flooring surfaces may cause problems for some individuals with dementia and sight loss who may have difficulty interpreting and walking on the change in surface. For the majority of users however, they are necessary to highlight that there is a change in level, or a crossing point.

Tactile paving at pedestrian crossing points is often laid incorrectly and sometimes unsuitable materials are used. This can cause confusion for blind and partially sighted people and also pose a potential trip or slip hazard. When designing pedestrian crossing and using tactile paving please refer to Guidance on the use of tactile paving surfaces (DETR, 1999).

Further guidance and reading

Guidance on the use of tactile paving surfaces (DETR, 1999)

DSOPM003: Tactile paving (2012) Surface inclusive design for getting outdoors

BS 8300: 2009+ A1 2010 Design of buildings and their approaches to meet the needs of disabled people – Code of practice. (BSI, 2010)

Stairs, ramps and escalators. Alderson, A (2010) Centre for Accessible Environments and RIBA Publishing, London.

3.6 The “seeing is believing” concept

Ensuring that things can clearly be seen can support the independence of a person who has dementia and sight loss.

Ensuring things can clearly be seen can:

- promote wayfinding and orientation
- act as a prompt to carry out a task
- help people to locate items easily
- help ensure they are not alarmed or frightened unnecessarily
- help improve continence
- remind someone to eat/drink/get dressed.

Areas to be considered when designing or adapting rooms for people with dementia include:

- “Glazed doors and windows into communal areas can give confidence to people when entering a room that they know what is going on inside” (Nicholson et al, 2008, p9). Any glazed areas should be designed to avoid collision hazards. See section 3.1.3 for further information.
- Bed positioned in front of toilet door.
- Open shelf and hanging areas area to wardrobe.
- Area to hang clothes on front of wardrobe.
- Open storage/shelves.
- Open storage cupboards for everyday items.
- Some dementia guidance recommends glazed cupboards and fridge doors. For people with dementia and sight loss this could be a problem due to the glazing causing reflections and glare (Please see 3.1.2 and 3.1.3). Additionally for people who have sight loss who may also have dementia the glazing on doors or cupboards may not be detected (Goodman and Watson, 2010b). It would be more appropriate to have an open shelf/ cupboard, or put items on a tray.

- Signs or pictures on doors indicating the use of the cupboard – for example picture of dishwasher or fridge.
- Drop down shelving in cupboards to bring things up to the eyes that people need to view closely.
- Lights positioned inside cupboards to highlight items in cupboards without causing glare
- Items for certain tasks kept together within view on an accessible tray so that the person can bring them up close – for example tea and coffee making facilities
- Consider night light in bathroom or sensor lighting that is turned on when someone gets out of the bed to light the route to the toilet
- Consider sensor lighting in bathroom which turns on immediately to enable people to see the location of sanitary ware
- Consider lighting used as a cue to promote continence, such as an automatic light by a commode in a bedroom
- Use transparent storage jars so people can see what is inside them.

Note:

- *Any items that are placed in view to support someone should be placed where they do not become an obstruction for someone with dementia and sight loss.
- *Ensure staff are aware which items need to be in view to support residents, so items are not cleared away or seen as clutter.
- *Care must be taken that having a number of items on view does not produce a visually cluttered area (please see 3.8.4).

Case studies – Care home built two years ago

Mrs S, aged 70, who has macular degeneration and Alzheimer's disease
 Mrs S had a large number of vision aids such as glasses and magnifiers. These were in a drawer out of sight. She kept forgetting to use them. Placing essential items to support her every day on a tray on top of the drawer unit helped her to remember she had items to assist her.

Extra Care home built two years ago

Mrs D, aged 65 who has Alzheimer's disease, cataracts and uses a wheelchair

Mrs D keeps forgetting where her food is kept, which means she often runs out of everyday essential items or forgets to make herself a cup of tea. Removing the cupboard door or putting everyday items on top of a work surface on a tray could alleviate the problem and help remind her where the items are.

Care home built two years ago

"At present the rooms are designed where the headboard of the bed is directly behind the en-suite. Residents are constantly alarmed and frightened when care staff appear from around the corner as they are unable to see them enter the room. In future I would change the room design so that residents can see people as they enter their room."

Care home manager

A coping strategy for loss of memory

"Having items close at hand is often used as a coping strategy by people with dementia/and or sight loss. This should not be confused with 'visual clutter' (see Section 3.8.4) as carers, professionals, family and friends can sometimes misunderstand this as 'cluttering up' or 'hoarding'. This only becomes a problem if they stop moving older, not needed items out of the way again. The key for carers is to preserve the coping strategy while ensuring it doesn't become too much for the person (or others).

"Loss of vision can make this even more necessary as people need things even closer but it gets harder to remove things from the periphery, so here clutter can build up but the key for carers is to recognise why the person needs to use this strategy rather than just remove the perceived problem".

Stephen Wey, 2013 review comments.

3.7 Acoustics

This section looks at:

3.7.1 Planning the environment to create good acoustics

3.7.2 Materials with acoustic absorbing properties

3.7.3 Transmission and insulation

3.7.4 Management of excess noise

3.7.5 Hearing enhancement systems.

3.7.1 Planning the environment to create good acoustics

The hard materials that are often used in buildings for ceilings, walls and floors can reflect sound and create a noisy environment in which a person who is deaf or hard of hearing, blind or partially sighted and who has dementia might have difficulty in understanding what is being said and interpreting the environment around them.

Creating a home with good acoustics can help ensure that people with dementia and sight loss and/or hearing loss can maximise their understanding of the environment by using their available hearing as effectively as possible. This is important both in communal areas and also an individual's home.

When planning finishes it is important that the acoustic design is taken into account so that excessive noise is reduced, reverberation and echo effects are minimised, individual spaces are private, and speech can be heard against background noise design (BSI, 2010; Pool, 2003, p5; CAE, 2006, p18; Perkins et al, 2004).

Blind and partially sighted people find changes in sound useful, for example the contrast between a hard floor for a walk route and carpet for other areas. They also rely on the character and quality of reflected sounds for orientation and can become confused due to the reverberation times, or echo effects that are often caused by sounds in buildings (BSI, 2010, p62). People with dementia may have a combination of either or both hearing and sight loss which affects their ability to interpret the environment around them (Bakker, 2003). For someone with dementia, auditory over-stimulation can also cause agitation which can contribute to fear.

Case study

Mrs G, aged 78, who has Alzheimer's disease, glaucoma, cataract and is blind in one eye.

Mrs G did not like being assisted to use the shower or toilet but could not use the facilities unaided. She found the experience frightening as other people had to assist her in showering and she could not see them very well due to tunnel vision caused by her glaucoma, cataracts and lack of sight in one eye. She found the bathroom echoed and was noisy which further increased her anxiety when having a shower.

Staff have changed how they approach Mrs G to ensure they talk to her, explain what they are doing when they enter the room and approach her head on rather from the side. She is now more relaxed when staff explain to her what they doing and approach her head on.

There are three areas to consider when planning for good acoustics:

- Absorption – the extent to which sound is absorbed through a material.
- Transmission – the extent to which sound is carried from one area to another.
- Insulation – the extent to which walls, floors and ceilings can prevent the transmission of noise. (MacManus and McCleganhan, 2010, p22)

3.7.2 Materials with acoustic absorbing properties

Materials can be chosen to absorb noise and provide a building that has good acoustics. Acoustic ceiling tiles can help absorb sound, but if the room is filled with other hard surfaces that do not absorb sound then the sound “will reverberate for a long time before the ceiling has any effect” (Briller et al, 2001, p29). Therefore acoustic treatments should be considered for walls and floors in addition to the ceiling.

Acoustic ceiling tiles used in an extra care home dining room.

Photographs courtesy of Tai Clwyd



Materials that reduce reverberation times are essential, particularly for larger spaces such as reception areas, communal lounges and dining areas and also in bathroom areas where acoustics can be a problem. Materials that reduce reverberation times absorb sound and minimise the amount of reflection, reducing the amount of reverberation in an area. This reduces the ambient noise level and improves speech intelligibility (Acoustics at Work, 2011).

Acoustic treatments to consider include:

- acoustic non slip flooring
- acoustic wall panels
- acoustic ceiling panels
- fire proofed wall hangings
- foam backed flooring
- carpets
- soft furnishings used on chairs and sofas
- curtains in addition to blinds
- lined curtains to further enhance absorption.

3.7.3 Transmission and insulation

Considerations whilst planning and constructing a building:

- Consider the acoustic separation of noisy rooms such as laundries, lift motor rooms, plant rooms and other communal spaces from residents' living, sitting and sleeping areas (Nicholson et al, 2008, p7).
- If layout permits, try to ensure that the living rooms of two adjoining flats are next to each other, and bedrooms of adjoining flats are next to bedrooms (Nicholson et al, 2008, p7).
- Ensure individual rooms are sound insulated to prevent noise from bedrooms/flats transmitting to other rooms or communal areas.
- Use materials with high sound insulation value such as those with a high mass such as concrete, dense plaster boards and brickwork.
- Ensure no gaps around doors and seal doors.
- Fill open mortar joints between walls and ceilings.
- Two skins of brickwork with a gap.
- Floating floors.

(MacManus and McCleganhan, 2010, pp22-23, 27)

3.7.4 Management of excess noise

Background noise can greatly affect people with hearing loss and particularly for those with hearing aids as the devices can magnify the sound (Briller et al, 2001, p28). For example, having the television on in a communal area can cause difficulties for some people with dementia who find constant background noise irritating and also some may not be able to screen out the sound in order to hear other sounds.

Background noise can be reduced by:

- Minimising the amount of background noise. Use table mats, table cloths and coasters to reduce noise at mealtimes.
- Partitioning off areas.
- Using vibrating call systems and personal pagers.
- Setting mobile phones on vibrate.
- Turning down volume on phone rings where appropriate.
- Keeping noisy tasks such as using the vacuum, tumble drier and washing machine when residents are not socialising
- Positioning activity and dining areas away from bedrooms
- Keeping noisy activities away from communal areas such as main communal kitchen and delivery points.
- Creating reserved quiet areas without televisions where residents can hold conversations.
- Sound proofing waste ducts and pipes to limit sounds.
- Using doorbells or door entry systems that do not ring throughout the building.

(Briller et al, 2001, p29; Bakker, 2003)

3.7.5 Hearing enhancement systems

There are number of hearing enhancement systems such as an induction loop, infrared or radio transmissions that can be incorporated in communal areas to assist people with hearing loss. In a care home/Extra Care home/sheltered housing site an induction loop system or infrared system can be used. An induction loop system is often a popular choice as they assist people with hearing aids and do not need specialist equipment. However they can prove problematical and pick up overspill from other rooms, be susceptible to electromagnetic interference such as dimmer switches and fluorescent lighting and produce an unpredictable sound for the user. Infrared systems can provide an alternative option but they will need a neckline transmitter which will need to be purchased by the care home/housing organisation.

When sourcing the correct type of hearing enhancement system specialist advice should be sought as early as possible during planning of new builds/refurbishment/maintenance to ensure any cables and devices can be built into a scheme. For example

- induction loop systems should be installed in the TV rooms, in communal rooms and in reception areas
- telephones used should be fitted with induction loops or specially designed for people with hearing loss

(Action on Hearing Loss/Echalier, 2012).

Further Advice on hearing loop systems

The UK's leading hearing loss charity, Action on Hearing Loss, can advise on hearing loop systems. For more information go to www.actiononhearingloss.org.uk/supporting-you/products-and-equipment/loop-systems.aspx

3.8 Wayfinding

3.8.1 Multi-sensory wayfinding

3.8.2 The importance of multi-sensory wayfinding

3.8.3 Examples of how multi-sensory cues can be used to assist wayfinding

- Personalisation of front door
- Seating areas
- Views of features
- Tactile features

3.8.4 Design issues to be considered

3.8.1 Multi-sensory wayfinding

For many individuals with dementia and sight loss, difficulties with orientation, disorientation and confusion regarding times and places is very common (Cohen and Weisman, 1991).

In order to try and alleviate these difficulties the promotion of appropriately placed layers of multi-sensory wayfinding tools that represent all the senses can help support individuals to orientate themselves around the internal and external environment.

Sounds, touch, sight and smells can all be used as a wayfinding strategy to help people with orientation of place, time and day and help make use of residual vision and the other senses, tactile, auditory and olfactory (touch, sound and smell).

Photograph – main entrance to site differentiated and highlighted against buggy store entrance to the left of the main entrance by four large planters, bench and canopy.

Photograph courtesy of Linc Cymru.



3.8.2 The importance of multi-sensory wayfinding

Due to the wide and varied effects that dementia can have on not just sight loss but all the senses there is not a prescriptive way that will help all individuals with wayfinding. Some people need or prefer more tactile sensory input whilst others need more visual sensory input. It is therefore important to incorporate layers of wayfinding tools to help maximise the number of individuals who will be able to orientate themselves around the environment. In an individual's home wayfinding tools can be tailored to suit the individual's needs and sensory preferences.

For example:

- A ticking clock in a hallway or a gentle hum of boiler may assist people in orientating themselves around their environment.
- Planting behind a recess would mean that when someone walked past they would be gently touched by the leaves and they would be aware they were in a particular area of a building.
- Covering a wall in a tactile wall covering could help people orientate where they are in their home.
- Adding an object of reference that can be touched and examined outside a room to highlight the room's purpose (in addition to signage – for further information see section 3.9) such as, a sponge outside a bathroom, a hairbrush outside a hairdressers.
- Using electric scented plug-in with particular scents for particular rooms could help some recognise where they are by the scent.

In addition, for someone with little or no residual sight, using landmarks, eg, 'just past the tree', can support the identification of space and overall spatial understanding.

Quote:

"I always know I am at the end of the garden when I am by the oak tree"

Mrs A, 69, dementia and cataracts living in Extra Care Home built 3 years ago

Tai Clwyd housing association have used a range of multi-sensory wayfinding features at this extra care development including a large ticking clock placed in an informal seating area and planting set behind a glass balustrade in order that the plant does not become an obstruction.



For some individuals multi-sensory wayfinding tools may not support orientation. Additionally the more advanced the dementia the less successful a multi-sensory wayfinding strategy may be. There may also come a time when certain wayfinding tools may cease to work as a person progresses through the stages of dementia and/or sight loss and other senses deteriorate. Despite this, there is still much merit in incorporating wayfinding tools when planning an environment to ensure people's senses and independence can be maximised where possible.



When planning an environment the following areas can help support individuals with orientation:

- Personalisation of someone's bedroom/apartment door which help support people to find their way independently back to their room (Nolan et al, 2002)
- Design features which help make corridors distinct and help divide long corridors eg colours, feature walls, distinctive murals, pictures, distinctive furniture, doors in a bright colour/distinct colour throughout building.
- One landmark should be present in each room and one in each subsection, ie, a landmark in each individual area of a garden (Goodman and Watson, 2010b).
- Seating needs to be in the right place – people need to feel they have a reason to sit there – eg, outside a lift, in a recessed area along a corridor to provide a resting place along routes, overlooking views to the outside. Such seating must not cause an obstruction or hazard for people with sight loss, eg, be located off the main walkway.
- Feature walls in different colours – these should have an LRV difference of 20 or more if possible to enable those with a loss of colour vision to identify the feature walls (see section 3.3 colour contrast).
- Tactile features in an environment – eg, tactile studs at ends of handrails, tactile wallpaper placed at the end of a corridor, tactile feature placed on the corner of each change of direction.
- Objects of reference to indicate a rooms purpose eg, flannel outside a bathroom. These objects of reference could be securely fixed so not to cause an obstruction or trip hazard if left on the floor.
- Rooms have distinctive signage with symbols eg, picture of book placed on library door, picture of scissors placed on hairdresser's door.
- Distinctive features eg, front entrance has distinctive features and is constructed in different materials to highlight the front entrance.
- Using different colours on different floor levels.
- Using themes on different levels – eg pictures of flowers on one floor and trees on another.

- Brightly/distinctive coloured toilet doors throughout building in same colour eg bright yellow doors have been shown to help people find their way to the door.
- Artwork placed around the environment should be familiar and promote a positive, happy and emotional effect. Representational design and abstract art should be avoided. Artwork/and or photographs of objects rather than people.
- Often an open lounge/dining area is used for meals and also for activities. Using specific cues for different activities can help residents identify when a specific activity or part of the daily routine is about to commence and can support wayfinding eg specific piece of music played before daily exercise routine, large musical note placed on wall and aromatherapy oil used to signify music session, coffee being brewed at teatimes.
- Designing zones in lounges for specific activities would produce easier to understand areas such as a reading area/library, computer area (Torrington, 2009, p256).
- Layouts of rooms should stay the same – this will aid people with trailing and support wayfinding.
- Storage should be provided in lounges to reduce clutter, and ensure things used for activities are not on permanent display which can confuse the space.
- Wind chime placed near door so that when door opens the wind chime makes a sound to signify to people someone is entering a particular room.
- Metronome in a room.
- Large distinctive ticking clock at the end of a corridor.
- Scented plants and plug ins.
- Use existing features within a garden to support wayfinding – eg large oak tree that is not surrounded by lots of other plants.
- Distinctive plants at particular positions in a garden with all year round colour and scents where possible eg use of evergreen and deciduous plants.

- Raised beds at certain points in the garden. Should not be placed everywhere as they will cease to be wayfinding tools.
- Water features internally and externally – these can provide a very relaxing environment and signify to a person they are in a certain room/in a certain area of the garden. However these should be used with caution as the continual sound of running water may encourage people to go to the toilet unnecessarily.

Caution: Wayfinding items should be carefully positioned to ensure that they do not cause an obstruction.

3.8.3 Examples of how multi-sensory cues can be used to assist wayfinding

Personalisation of front door

Photograph – Front door personalised by residents to promote wayfinding.
Photograph courtesy of Linc Cymru



Personalisation of someone's front door can be achieved using a number of methods that can be incorporated when designing a new interior scheme. This can be further developed by carers to meet the needs of individual residents living within the buildings.

For example:

- Placing a name on front of a door on A4 page in large print.
- Distinctive features of door such as colour, door design, coloured alcoves, clear door number.
- Non-glare lighting above or to the side of front door.
- Memory boxes or shelf/sill placed outside door with personal artefacts. Some individuals are often unable to recognise family members and in this case photographs and/or items from early on in a person's life may help a person locate their own bedroom.
- Residents should be encouraged to personalise their doors to help ensure they are able to locate these wayfinding tools.

Quotes:

"The memory boxes do not help residents find their way back to their room. However they do provide a point of interest and topics of conversation between carers and residents and an insight to carers of resident's lifetime experiences". **Nursing home manager**

"The combination of distinctive coloured floors and distinctive pictures and features really supports wayfinding around the building for our residents. For example Mrs J knows she is on her floor due to its lilac colour, she knows she is outside her room due to the dark purple recess painted around her room and the picture of a rose outside her door."
Extra Care Scheme Manager

"Some people find their way to their front door by their door number, others have placed a picture on the front of the door to find their way to their property, others have their name on their doors and others cannot find their way to their own door without assistance".
Extra Care Scheme Manager

Case study

Miss D, 68, with dementia and cataracts living in a nursing home on an EMI (Elderly Mentally Ill) corridor

Mrs D was confused and couldn't find her way to her room when she moved from one floor to another as her door number had changed. To alleviate this, the carers placed her old number on her front door to help her find her way to her room independently.

Seating areas

Strategically placed seating areas along routes or near key features such as a lift can help orientation and wayfinding. It is important seating areas are located in defined areas off the main walkway so not to create an obstruction or hazard for people with severe sight loss. Highlighting through use of tonal contrast is useful.

Seating area placed in corridor with views through communal garden windows providing an informal gathering place and resting point along route whilst also supporting wayfinding along the corridor

Photograph courtesy of Linc Cymru



Seating areas placed outside lift to provide place to sit and support wayfinding to lift from corridor. Furnishings, plants and paintings are distinctive to each floor.

Photographs courtesy of Tai Clwyd



Views of features

Views to the outside of distinctive features can help people locate where they are in the building (eg, a window with a view of an oak tree). They can also provide diurnal and seasonal cues (Torrington, 2009 p254). Ideally these would be windows rather than doors as some people with dementia may try and get out of glazed doors and this can cause much distress if doors are locked.

Internal views of rooms from corridors can support people in locating the rooms position and function such as a dining room or sitting room (Pool, 2004).

Note: Large areas of glazing needs to be highlighted as transparent glazing in doors and screens can represent a risk of injury through collision as people may be unaware of the physical barrier (CAE/RIBA 2006, p11). (See section 3.1.3 for further information on highlighting glazing).

Photograph – view of the outside via windows helps to locate where you are in the building. At this extra care site the rear garden entrance overlooks a school playing field. The sliding doors and level threshold are good features that enable residents to easily access the garden. The bench enables residents to enjoy the garden and rest along routes. The thick frames and transoms help highlight the position of the glazing. Some residents with dementia may find change in surface from carpet to paving difficult to negotiate as it may be seen as an obstacle or step. The staff at this site were trained in dementia and sight loss which enabled them to assist residents where necessary.



Photograph courtesy of Linc Cymru.

Tactile features

Tactile features can help support an individuals understanding of where they are in a building, eg, textured wall paper, plants, tactile feature placed on end of a handrail to signify stairs starting or ending.

Photograph – Plants are placed behind handrails so that people can feel when they brush past them. This signifies to some individuals that have little or no residual sight that they are by the door to the corridor that leads to the café.



Photograph courtesy of Shaw Trust

3.8.4 Design issues to be considered

When planning any wayfinding please ensure:

- Wayfinding tools can be seen from as many directions as possible
- Ensure that wayfinding tools stand out from their environment. For example, for a wayfinding tool such as a clock or a picture to be seen it must stand out against its background.
- Ensure the wayfinding tools are free of visual clutter around them. For example, do not place a wayfinding tool next to a notice board.
- Set any wayfinding tools back from the main line of walk so that they are not obstructions.
- Wayfinding tools should be permanent features to ensure that they can be relied upon, eg, scented plug-in always left on, water feature always left on in a hall.
- Use colour and tonal contrast alongside good lighting.
- When using sounds in an environment it is important to consider the needs of people with hearing loss to ensure that sounds do not cause agitation or cause sounds to resonate in someone's ear.
- Too much sound in an environment can be confusing and may prevent people from picking up useful pieces of sound information. For example having a television permanently on in a room can reduce the impact of other useful sounds.

Visual Clutter

“Simplifying the environment to stop over-stimulation would vastly improve the quality of life of people” **Prof Fleming, director of the NSW-ACT Dementia Training Study Centre (Marden, 2012)**

A visually cluttered environment is one where visual distractions, like backgrounds and objects, prevent someone from selecting a single object or the correct object (Caregiving with Purpose, 2012). A visually cluttered environment can be difficult for people with dementia and sight loss to understand. A complex visual environment can overload individuals with visual stimuli which can act as barrier to individuals finding their way around the environment and/or determining a room’s function or use.

The strategy “less is more” is one to adopt when designing areas and choosing furnishings and accessories (www.perkins.org 2013). The design and layout of a home should be easy to understand and interpret. Furnishings and accessories should be chosen and placed carefully to ensure that an area is not visually cluttered.

3.9 Signage: a key part of a wayfinding strategy

3.9.1 Different types of signs

3.9.2 Placement of signs

3.9.3 Additional considerations

- Objects of reference
- Adaptable signs
- Visual clutter
- Display/Notice boards

Used in conjunction with other wayfinding tools, signage can form a key part of wayfinding strategy to support individuals in finding their way around their home environment. As with many areas within the built environment there is not one method of signage that will meet the needs of all individuals with dementia and sight loss.

The following issues should be considered when planning an accessible signage system:

- Sans serif text should be used.
- Lines of text should be ranged left (unjustified).
- Letters, symbols and pictograms should contrast visually with the signboard. Light colour text and symbols on a dark background are the preferred option.
- The sign board should contrast against its background. If this is not achievable then a visually contrasting border should be placed around the sign.
- Signage for information or direction should not be similar colours to safety signage.
- Sentences or single word messages should begin with an upper case letter and continue with lower case letters. Words entirely in upper case type (capitals) should be avoided. Start each main word with a capital, ie: Training Room.
- Messages should be kept as simple as possible. Information should be kept as concise as possible with the maximum of 12-14 letters per line/ two to three words per line.

- Tactile symbols incorporated within the design of a sign such as a bath, toilet or television could greatly assist people with the purpose of rooms. Additionally braille lettering could be placed around the home/development to further assist in wayfinding for those with sight loss. Braille can be integrated into the accessible sign. Tactile symbol, tactile text with Grade I braille directly below ranged left below the text.
- The placement of signs should be consistent (1400mm – 1700mm from finished floor level) and should be placed on the door and/or next to the door latch where the door will regularly be open to allow the sign to be seen at all times.
- The placing of signs should be consistent around the building in terms of height and position.
- Signage should have a non-glare coating to make signs easy to read. Signage should be positioned not to receive glare from natural daylighting and artificial lighting. Suspended signs should not be placed against a light source to avoid glare.
- Where suspended signs are used lower level tactile signs should also be used as suspended signs can be very difficult for users with a visual impairment to locate and read.
- Where signage is placed externally it should be lit by diffused light fittings that do not cause glare.

3.9.1 Different types of signs

There are four main types of signage that can form part of the external and internal wayfinding strategy to help residents, staff and visitors negotiate their way around the environment.

Information signs – are the main signs for orientation, eg building and car park signs, directory, map. They should include brief instructions to help people find lifts, ramps and staircases.



Directional signs – direct people to destinations using arrows and text. Corridors should have signs at each point of entry and key decision points.



Identification signs – are used for numbering or naming rooms.



Identification signs



Safety signs – are warning or prohibition signs, positioned at strategic points to give safety information or warn of a hazard.



Audible signage – may be considered to help highlight a rooms position or location within a building. Its volume must not be too loud to cause auditory clutter. Care should also be taken that the voice used is gentle and that signage does not startle or frighten residents. Audible signage can be integrated into the accessible signage however, consider the method of triggering. If triggered by motion sensors or infra-red then the sign can be playing all the time, if triggered by push button then the user needs to be able to find the activation button.



3.9.2 Placement of signs

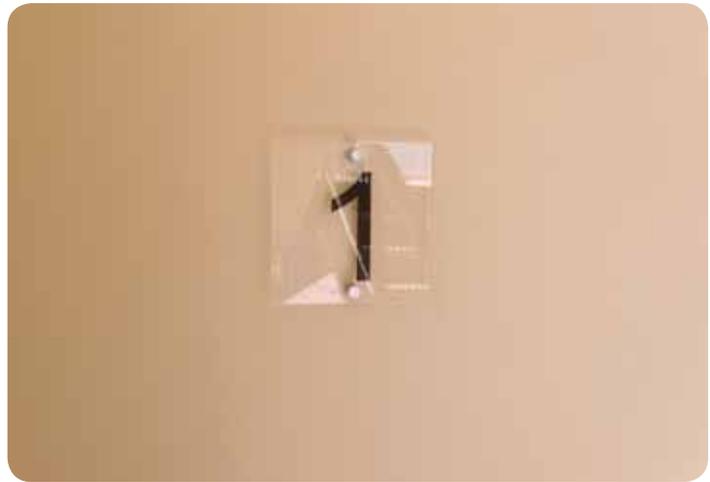
A building should incorporate signage at key destinations such as:

- approach from main road to main entrance/parking
- parking and disabled parking
- setting down points
- garden/courtyard
- wheelchair/buggy store
- entrance/exit/front door
- main lobby or reception
- communal facilities such as w/c and main communal area
- apartments
- fire exits.

(Barker and Fraser, 2000, p24)

Signs should be placed on the door unless the door is likely to be open a great deal. If the door is permanently open one sign placed adjacent to the door may be more appropriate.

Photograph of signage in an Extra Care Scheme – Perspex signs are very reflective and can be a source of glare from lighting, making the sign difficult to read. There is no contrast with the sign against its background making it difficult for some individuals to identify. The text should be left aligned to make it easier to read.



Information sign displaying glare, reflections and block capitals making it difficult to read. Please see section 3.1 for more information on glare and reflections.



3.9.3 Additional considerations

Objects of reference

Objects of reference can be placed directly below a sign to further highlight the room's purpose. These should be securely fixed so as not to become a trip hazard or obstruction. These items give tactile feedback as they can be touched, picked up and examined.

The images are of signage within a care home setting. The signs feature tactile writing, braille, good levels of colour and tonal contrast and a symbol to help individuals identify the rooms function. An image of the room has been placed below the sign to further support residents with identification of the room's function.

Photographs courtesy of MK Design and Linc Cymru



Adaptable signs

Signs and symbols may need to be added at a later date to enhance independence. For example, in one care home signs with a symbol of a toilet were added to residents' toilet doors to help find their way to the toilet and prevent them from walking the corridors in search of a toilet during the night. It is always more cost effective and aesthetically better to start with an accessible sign that includes the raised symbol, raised text and braille rather than trying to retro-fit after.

Visual clutter

For signage and wayfinding tools to be fully effective it is important that corridors and rooms are kept free of visual clutter in order that wayfinding tools and locational markers can be easily identified. Fixing permanent notice boards can help keep visual clutter in corridors to a minimum.

Display/Notice boards

When managing the building in order that signage and wayfinding tools are not disguised by visual clutter caused by display/notice boards the following should be considered:

- Displays should be clearly separated from each other.
- Displays are rationalised.
- Displays are printed following RNIB Clear print standards (RNIB, 2006. pp22-6).
- Items are displayed against a clear, plain background which provides good background contrast.
- Doors are not used as notice boards.
- Notice boards are fitted to walls and notices do not stray outside these areas.

Further reading on signage

Sign Design Guide: a guide to inclusive signage (Barker and Fraser, 2000)

See it Right: Making information accessible for people with sight problems (RNIB, 2006)

BS8300 (BSI, 2010)

3.10 Distinctive rooms/areas for activities

“Recreation, social and community activities and personal development are key factors for everyone and contribute to health and wellbeing among older people even where there is advanced frailty” (**Help the Aged, 2010, p3**).

At all stages of dementia activities need to be available whether the person is in sheltered housing, Extra Care housing, a care home or in their own home. Often things we take for granted such as cooking and cleaning can have great benefits for people with dementia giving pleasure and a purpose to the day.

People with dementia enjoy the same sort of activities as everyone else such as:

- social participation
- inter-generational activities – eg, opportunities to take part in activities with grand children, local school children
- community participation
- physical activity
- creative activities
- activities of daily living – washing, cleaning, cooking
- music
- conversation
- pottering in the home
- pottering outside
- food and eating
- enjoyment of nature
- reminiscence
- mind games such as jigsaws
- reading
- television (Sixsmith et al, 2007).

Television and radio can often take over a room's function so a separate area is needed for other activities. People with dementia and/or sight loss find it difficult to screen out noise. In some of the nursing homes visited during this research there was one central room for residents – it was difficult for those who did not want to view the television to get away from the noise, other than being in their bedroom.

A number of portable interactive activities should be available within communal areas or within a resident's room/home as some people with dementia may not like to, or may not be able to, go to a certain room/location to take part in an activity. As the dementia progresses activities may need to increasingly take the form of small but significant windows of opportunity that require staff to be sensitive and open. For example, 30 second activities promoted by the "best friend approach" (Bell and Troxell, 2011) www.bestfriendsapproach.com

Photograph of hairdressers.

Photograph courtesy of
Tai Clwyd



To help create areas that provide opportunities for meaningful activity the following issues should be considered:

- Where possible provide more than one communal area to accommodate different types of activities.
- Provide rooms that are domestic and as familiar as possible.
- Mono-functional rooms are preferable to multi-functional rooms (Social Care Institute for Excellence ARUP and the Thomas Pocklington Trust (2012))
- Provide small areas for quiet activities separate from the main communal lounge where there is a television in the main communal lounge.
- The décor of the area/room should reflect its primary use or be adaptable where used for different activities, eg, use of displays or wall art/posters to emphasise an activity.
- Rooms with an obvious function work well for people with dementia where they are defined by their fittings.
- Storage should be provided in lounges to reduce clutter and ensure things used for activities are not on permanent display which can confuse the space.
- Designing zones in lounges for specific activities would produce easier to understand areas such as a reading area/library, computer area (Torrington, 2009, p256).
- Opening up communal areas rather than closing up areas encourages people to socialise (Torrington, 2008, p254) eg, communal area with double doors that are kept constantly open, seating areas along corridors encourage people to sit and socialise.
- Ensure all internal and external communal and activity areas are designed in line with this guidance to be accessible and welcoming for people with dementia and sight loss.

Note: furniture should be left in permanent positions and not moved around to assist people in orientating their way around an environment. Furniture layout plans should be set up for all staff to ensure if furniture is moved for cleaning or a particular activity that it is put back in the same place.

Case study

The sunroom on the second floor provides a secondary seating area that is suitable for a range of activities and has fantastic views over the city of Cardiff. It is often used by residents for parties, but also it provides a quiet area where some residents like to go and read or knit when they don't want to use the main communal area. **Extra Care Home Manager, Extra Care home 2 years old**

Photographs courtesy of Linc Cymru



For further information please see

www.bettercarehomes.org

Improving Dining and Bedroom Environments in Care Homes (Timlin and Rysenbery, 2010)

Portable activities – 30 second activities promoted by the best friend approach

www.bestfriendsapproach.com

3.11 Handrails and rest areas along routes

3.11.1 Handrails

3.11.2 Benches/Seating areas

Case study

“The ground floor corridor has no rest areas and staff have identified this causes residents to walk a lot faster through this corridor. This has increased the risk of falls and accidents in comparison to the other two floors which have rest areas along the corridors.” **Support worker at Extra Care home**

3.11.1 Handrails

Older people with dementia can often be frail and have an unsteady gait. Handrails can assist a person with support to help them to navigate around the access routes more easily and allow people to rest and steady themselves along the route (RNIB Cymru, 2003, p20).

External handrails can support mobility and encourage residents to use the external areas of the site with the knowledge they can use the handrail if they need to rest along route.

Handrail design

- Handrails should be oval or round in profile and contrast against their background.
- Two sets of handrails set at different heights may support residents of differing heights and abilities.
- Any ends of handrails should be designed to minimise the risk of clothing being caught.
- Hand rails should be placed out of the main line of travel.
- Externally handrails can be incorporated into fencing /boundary walls to support people along access routes.
- Tactile studs could be placed at the end and start of handrails to indicate the beginning and end of a handrail.
- Handrails should be continuous along a route.

Photograph – Handrails are incorporated within balustrade at an Extra Care site.

Photograph courtesy of Linc Cymru



3.11.2 Benches/Seating areas

Benches and seating areas should be considered for external and internal communal areas to enable residents to rest along route.

Any seating areas/benches should be placed off the main line of walk and set back from any fire exits. Seating should have back and arm rests to allow ease of access when sitting, resting and rising.

Thought should go into where they are placed along routes to promote areas of interest and provide natural resting areas. For example, seating placed along corridors, outside a lift or close to the main entrance can provide an informal gathering point by encouraging people to sit down, rest and chat to other residents.

Seating areas which use distinctive features such as different chair design, fabric textures and colours can also help support wayfinding along routes (see section 3.8 Wayfinding).

Photograph – Seating area used to break up long corridor and provide a resting place along route for residents.

Photograph courtesy of Linc Cymru



Photograph – Benches placed within garden are an excellent feature, enabling residents to rest along routes.

Photograph courtesy of Linc Cymru



Further reading

For guidance on functional, homely, and comfortable furniture with sufficient support please see

Chairs: Guidelines for the purchase of Lounge, Dining and Occasional Chairs for Elderly Long Term Residents (1997) Dementia Services Development Centre

For guidance on arranging communal areas to encourage a home like environment and increase participation please see

Visio-perceptive cognitive defects in Alzheimer's disease. (Jones et al, 2008).

3.12 Products and controls

3.12.1 Door entry systems

3.12.2 Door furniture

3.12.3 Assisted bathrooms

3.12.4 Taps and flushes

3.12.5 Lifts

3.12.6 Fire exit call boxes

To promote independence the following issues should be considered when specifying products and controls:

- Ensure products to be used by people with dementia and sight loss are easy to **identify, use and control**.
- In the majority of cases instructions or a manual should not need to be read to operate products and controls, eg choose a microwave with one dial that turns rather than one that is operated by a range of buttons and dials.
- Logical layout and controls will assist people with dementia who may find it difficult to learn new things.
- Products and controls should, where appropriate, provide good visual and tactile contrast and where necessary incorporate braille.
- Specify products that contribute to the homely feeling desired in the setting rather than of institutional appearance.

3.12.1 Door entry systems

Door entry systems should be accessible and easy to use so that residents with dementia and sight loss, where appropriate, can enter and exit the building and gardens independently.

The operation of many door entry systems on the market poses a real problem for many older people. Numbers and buttons are often difficult to decipher and are too small with no tactile or contrasting features which makes locating the correct buttons difficult. When ordering door entry systems it is essential to specify accessible products. These should follow the standards of BS8300 (BSI, 2010) to meet the requirements of all potential users.

The following issues should be considered when specifying door entry systems:

- Any door entry systems fitted should clearly contrast with its background and should be located on the latch side at a height between 1000mm to 1200mm from the finished floor level.
- Have tactile buttons that are easily distinguishable through the use of colour contrast and tactile identification.
- Provide verbal feedback when buttons are pressed.
- Have a speaker that is easily identifiable.
- Have instructions that are clearly presented in appropriate formats and be constructed in a robust, non-perishable and non-fade material.

(RNIB Cymru, 2003, p.42; Thomas Pocklington Trust, 2008, p86)

3.12.2 Door furniture

Specification and provision of door furniture that is easy to locate and use will support the independence of people with dementia and sight loss.

Photograph – Door furniture contrasts against the door. Handle returns back on itself to prevent clothing being caught on the end. Lock is positioned above handle for easy access. Door contrasts against wall. Dark purple colour used outside residents door in a different shade to surrounding residents doors to enhance wayfinding. Handrail contrasts against wall.

Photograph courtesy of Linc Cymru



The following issues should be considered when specifying door furniture:

- Ensure door furniture products are easy to identify, use and control.
- Door furniture should contrast in colour or tone with the door.
- D shaped lever handles that return to the door should be specified on all doors to prevent clothes becoming caught on the end of handles.
- Locks on doors should be simple to use and should not require more than one hand.
- Locks to front doors should be fitted above handles.
- Incorporate large contrasting door numbers to make individual flats/rooms easier to identify.

3.12.3 Assisted bathrooms

Many people with dementia and sight loss find bathing in assisted bathrooms a frightening experience. Assisted bathrooms can often appear very sanitised, clinical and uninviting for the user. It is recommended bathrooms are made as homely as possible and give off more of a spa feel than an institutionalised bathroom.

The following issues should be considered when specifying assisted bathrooms:

- Use colour, materials and products that make the bathroom attractive and 'homely'. (See image that follows and Tai Clwyds assisted bathroom section 3.3.3 on page 74)
- The bathtub should replicate a residential bath as much as possible, while supporting assisted bathing.
- Consider acoustic absorbent surfaces and treatments to reduce the echo and reverberation effects of noise often found within the bathroom.

Attention needs to be paid to the equipment, particularly the bath. Research shows that the type of bath used in assisted bathrooms can be critical as some baths trigger more agitation than others (Sloane et al, 1995). We would advocate the incorporation of sensory stimulation to help ease the trauma of assisted bathing. This could include items such as domestic style tiling, plush fabrics used as window treatments, bath oil, bath foam and aromatherapy oils where appropriate, fluffy towels, provision of bath robes, dimmer switches to control light levels, bathers favourite music and pictures of nature placed around the room. Heat lamps can be incorporated to keep residents warm before and after bathing (Bakker, 2003; Perkins et al, 2007).

Bathrooms can often be noisy and create echoes due to the large number of hard surfaces within them. This can make bathing a difficult experience for people with dementia and/or sight loss who are unable to screen out noise. Acoustic absorbent surfaces and treatments should be considered to reduce the echo and reverberation effects of noise often found within the bathroom (See Section 3.9: Acoustics).

3.12.4 Taps and flushes

Taps and flushes should be easy to identify and use by all residents, staff and visitors including those with dementia and sight loss. This will assist in promoting independence, hygiene and wellbeing.

The specification of taps and flushes should meet the guidance in BS8300 (BSI, 2010) to consider the requirements of all older and disabled people. Specific requirements for people with dementia and sight loss are listed below.

The following issues should be considered when specifying taps and flushes:

- Separate hot and cold lever taps should be fitted to sinks and baths.
- Colour and tactile features should be used to highlight hot and cold taps.
- Ensure toilet flushes are easy to identify, reach and use. Large paddle flushes are recommended.

Many toilets today are fitted with dual flush push buttons. These can be difficult for older people and people with dementia and sight loss to identify and use. Large paddle flushes are the preferred option as they can enable people with limited dexterity to operate the toilet independently.

Dual flush push button can be difficult to decipher and operate.

Paddle flush can enable someone with limited dexterity to flush the toilet.

Photograph courtesy of Linc Cymru



Environmental sustainability considerations

Housing providers have raised concerns that the choice of lever taps and paddle flushes available will not meet the water saving standards within the Code for Sustainable Homes (DCLG, 2010) or the BREEAM Multi-residential scheme (BREEAM, 2008). Among the issues raised is that many paddle flushes cannot meet the low flush requirements of the CSH and many lever taps cannot be fitted with flow restrictors.

In all cases, to promote the independence of people with dementia and sight loss we would advocate that products are sourced that meet both standards. If taps and levers are not accessible for residents they will be unable to use them, or to do so effectively.

Careful specification is needed, for instance some product brochures such as Green Building Store include low water use toilets with 'lever flush for disabled people'. In the case of lever tap systems this issue can be overcome by fitting lever taps with a flow restrictor within the supply pipework.

BREEAM New Construction 2011 (BREEAM, 2011) technical Manual under WAT 01 Water consumption (page 215), states that, for healthcare facilities, the flushing control for each WC/urinal in a healthcare facility must be suitable for operation by patients with frail or infirm hands or activated by electronic sensors. Designers may wish to consider the suitability of flushing controls for residents with dementia and sight loss in a care home environment.

The specification of accessible products would also be in line with requirements to consider end users, such as BREEAM New Construction (BREEAM, 2011) Management 01 Sustainable Procurement which requires consideration of end user requirements; and Management 04 Stakeholder Participation which requires the design, plan and delivery of accessible, functional and inclusive buildings in consultation with current and future building users.

3.12.5 Lifts

Lifts are an excellent way of supporting residents who are not able to manage stairs. However, some individuals with dementia and sight loss do not like using lifts due to their design, eg mirrors, shiny chrome surfaces and very dark flooring. Additionally, lift controls are often small, lack contrast and are difficult to locate and use.

To minimise the use of lifts, regularly used communal facilities should ideally be located on the ground floor.

Lift specifications should meet the standards of Part M AD and BS8300 (BSI, 2010) to provide for all users. Means of escape from upper and lower floors and the provision of refuges must be considered when providing a lift.

When planning Extra Care developments, the number of lifts within a development should be taken into consideration. During our research it was found that where there was only one lift, tenants, staff and visitors could have to wait a long time for a lift to arrive.

The following issues should be considered to meet the specific requirements of people with dementia and sight loss:

- Consider placing flats/rooms allocated for people with dementia and/or sight loss on the ground floor, along with communal facilities, to alleviate the need to use lifts on a regular basis.
- Lift surfaces should be matt or mid sheen.
- The use of chrome/stainless steel should be avoided – coloured matt walls would be a more appropriate choice than stainless steel.
- The lift car door should contrast against the wall.
- The walls of the lift car should contrast with the floor.
- When selecting flooring specify a lift floor that is higher than 20 LRV as below 20 LRV is a dark floor that could be perceived by someone who has dementia and sight loss as an open lift shaft or a hole. (See Section 3.4 for information on LRV).
- Lift doors must stay open long enough to allow the slowest person to gain entry, minimum 20 seconds (this can be over-ridden by pressing a floor call button).

- Door sensors should continue down to a low level (around 125mm above floor level) to prevent guide dogs being trapped between the doors.
- A blind should be incorporated to cover up mirror if necessary
- The control panel should contrast against the walls both internally and externally.
- The lift buttons, numbers and writing should contrast against the control panel.
- The lift text should be large and clearly contrast against the buttons to assist people with dementia and/or sight loss in locating the floor they wish to use.
- The numerals and symbols on the buttons should be embossed and braille should be provided. For this reason the buttons should not be touch sensitive.
- Buttons should illuminate to register a call.
- Audible information should be provided. The voice tone and pitch should be considered and the volume controllable to avoid startling residents with dementia and sight loss.

For existing lifts:

- Consider providing a blind to cover the mirror when necessary.
- The addition of coloured 'bump-ons' in various shapes and sizes could help assist some individuals in locating the lift buttons.
- **Care management** – Scheme managers should work alongside residents with dementia and sight loss in order to select the shape and colour bump-on that provides the best form of identification for them. Consideration should be given to locating people with dementia and/or sight loss in flats or bedrooms on the ground floor if they do not like using lifts. Providing a chair lift on stairs may support some residents who find lifts a frightening experience. Equally, using a chair lift for some may be a frightening experience.

Photographs – Lift in an Extra Care development. Some individuals did not like to use the lift due to large amount of reflective surfaces. A selection of matt finish for the walls is recommended as displayed in the image below.



The addition of a green coloured bump-on is used to help residents with sight loss and dementia to locate the lift button against its background.



3.12.6 Fire exit call boxes

In the nursing homes visited in our research, the fire door emergency door release button had proved an issue and a great attraction to residents who were continually breaking the glass and opening the fire doors and exiting outside.

Photograph courtesy of Linc Cymru



In one nursing home this problem was alleviated by covers being fitted with an alarm which sends a piercing noise when touched. This prevented residents lifting the flap on the box and opening the fire doors.



Photograph courtesy of Hafod Care

When considering any alterations to fire/emergency exit doors or controls the advice of a specialist fire officer should be sought.

3.13 Assistive technology

Assistive technology is “any product or service designed to enable independence for people” (Kings Fund, 2001). Assistive technology can involve low-level technologies such as an audible liquid level indicator or high-level technology such as telecare packages.

Photographs – Low tech assistive technology.

Talking measuring jug and audible liquid level indicator.

For further information please visit rnib.org.uk/shop



Technology such as smart technology and the technology within a smart home is constantly evolving. For this reason this section does not explain how specific examples work or name specific examples but considers how assistive technology may be used to support the independence of individuals with dementia.

Assistive technology can support active ageing and keep people safe and independent. It can also enable them to carry out daily living activities and help individuals stay in their own home or as independent as possible within a care setting. Using technology such as smart technology can allow people to carry out daily living activities within their own home whilst at the same time being automatically monitored for early warning in health changes and alert carers of any possible risks or danger that a person may be facing. It can help ensure people with dementia do not put themselves and others at risk and/or enhance the support provided by carers. It can be used to prevent fires, flooding, falls and danger from getting lost (Beech and Roberts, 2009, p.1).

It is advisable to consider the use of assistive technology as early as possible when building or altering a home. This will help ensure homes are future-proofed and are able to respond to future demands.

Assistive technology can be used to:

- Support orientation in a room and assist with activities, eg using talking labels.
- Digital Reminiscence Software – software to support people with reminiscence activities.
- Alert carers/individuals that the cooker has been left on to prevent fire.
- Alert carers/individuals of a gas leak, high levels of carbon monoxide or smoke.
- Provide audible or visual prompts to remind people to do things.
- Alert carers/individuals that a bath is overflowing.
- Monitor water temperature.
- Alert carers/individuals to a tap has been left on.
- Automatically turn on a light when someone gets out of bed, to prevent falls.
- Alert carers that someone has fallen.

- Alert carers when residents have exited flats at night.
- Detect movement in bedrooms to alert carers that residents may be wandering at night by using pressure mats/infrared detectors.
- Assist care staff in reducing their paperwork by monitoring care times and enable carers to focus on spending more quality time with individuals.

Case study – Care Home Manager of a newly built care home

“We are bogged down with paper work. In the next care home I would introduce a system that would help with monitoring residents and reduce paperwork to allow us to do our job and spend more quality time with the residents.”

The following issues should be considered regarding assistive technology

- Consider the use of assistive technology to support the independence of people with dementia and sight loss and/or to enhance the support provided by carers/staff
- There are ethical considerations to be taken into account when introducing assistive technology. For advice on what should be taken into consideration please see *Telecare and Dementia* (DSDC/Joint Improvement Team, 2010)

Further reading and useful links

Telecare and Dementia (DSDC/Joint Improvement Team, 2010)

For information on telecare/assistive technology and its development in Wales Social Services Improvement Agency Website

www.ssiacymru.org.uk/telecare

AT Dementia – organisation providing information and advice about what kind of devices are available and has a database of suppliers. AT Dementia have produced an interactive guide – AT that can support people in choosing suitable AT to meet individual needs. **www.atdementia.org.uk**

Telecare learning and improvement network **www.telecarelin.org.uk**

3.14 Accessible gardens and external areas

3.14.1 Planning external areas

3.14.2 Landscaping

3.14.3 Paths

3.14.1 Planning external areas

The criteria below should be considered when planning external areas to help encourage maximum use of the gardens whilst keeping residents safe.

- Sensory experiences such as wind chimes, water features or plants that rustle in the wind, can provide a multi-sensory environment and help those with sight loss orientate their way around the garden.
- Frequent resting places along pathways.
- Handrails along pathways.
- Provide additional seating that is undercover to enable those who are sensitive to the sun and heat to sit outside.
- Landmarks for orientation.
- Adequate width of paths for passing with sighted guides and wheelchairs.
- Paths clearly contrasting and defined from their surrounding surfaces and roadways.
- Raised flowerbeds set back from main line of walk.
- Areas for residents to engage in garden-based activities including gardening and outdoor games.
- Night time illumination.
- Street furniture such as benches and bins set off main line of walk.
- Smooth, level and non-slip pathways.
- Limited changes in surfaces and levels.
- Ensure changes in surfaces and levels are accompanied by handrails.
- Changes in level clearly highlighted in conjunction with the recommendations with BS8300 (BSI, 2010).

- Keep pathway surfaces the same unless there is a change in level that needs to be highlighted.
- Manholes covered in the same material as the surrounding surface.
- Use fencing and hedges to act as acoustic barriers.
- Avoid creating deep shadows by careful siting of dense planting and placing of wayfinding tools (Goodman and Watson, 2010b). Ensure any wayfinding tools or objects placed in the garden are set back from main line of walk and are not trip or collision hazards.
- Avoid windows opening over paths.

Sheltered housing communal garden. RCT Homes have used a clearly defined pathway, scented plants, lighting and benches to help make maximum use of the garden.

Photograph courtesy of RCT Homes



3.14.2 Landscaping

Appropriately chosen and located planting of a distinctive shape and/or texture, colour, sound or fragrance set within landscaping and planters can act as navigation aids and offer wayfinding assistance around the external environment (RNIB Cymru, 2003, p20; Thomas Pocklington Trust, 2008, p12). For example plants such as bamboos and grasses, and some shrubs and trees, such as willows, can add a sonic dimension to a garden. Plants with texture can add another sensory dimension to a garden. Other examples include: hanging baskets, sweet smelling plants at doorways, strong smelling plants at exits, planting at entrances that are distinctly different in colour, form and shape from other plants.

Care must be taken when positioning sweet smelling plants to avoid a confusion of perfume. Care must also be taken that plants are not poisonous, prickly and that they can be safely touched as some plants cause allergies or irritate the skin.

When designing the landscaping it is recommended to plan for year round colour, shape and fragrance to promote wayfinding. These should be placed at the main entrance and exit and at key points around the development to provide permanent wayfinding clues, eg, planters with distinctive trees, planting placed either side of entrance doors can help highlight entrances (provided they are not hazards or obstacles).

Special attention should be paid to obstacles above waist height, since these are often not detected by people with serious sight problems using long canes and guide dogs. Tree branches and other foliage should be cut back to ensure a minimum clear headroom of 2100mm, preferably 3000mm.

The planting chosen should be easy to maintain in the future and positioned out of the travel route. Care should be taken that planting is well maintained so they do not become a slip hazard or collision hazard (RNIB Cymru, 2003, p20). Paths need to be kept clear of debris and obstructions and creeping plants should be kept off paths, steps, ramps and signs. Root disturbance should be prevented as it can create a trip hazard.

3.14.3 Paths

Gardens for people with dementia are often designed to meander, use curved pathways and walls, and use circular routes with no ends. These are thought to be preferred by people with dementia, whereas people with sight loss often find pathways with straight lines and 90 degree turns easier to navigate. Due to the varied nature of symptoms caused by dementia and sight loss the research found that no one type of path was preferred by people with dementia and sight loss. In future this is an area that could be further researched to find a more definitive answer. Due to the varied nature of symptoms caused by dementia and sight loss it is unlikely that a particular type of path or type of change of direction will be preferred overall. In the interim we would therefore recommend that straight paths with 90 degree turns are used rather than curved pathways to support people with sight loss who may also have dementia when navigating routes.

For further reading and discussion on curved/straight pathways – please see Goodman and Watson (2010a and 2010b)

Further reading

Designing balconies, roof terraces and roof gardens for people with dementia (Marshall, 2010).

Designing gardens for people with dementia (Pollock, 2007).

3.15 The provision of dementia wards

There is no universal agreement about how large Extra Care homes and wards within care home should be. There is also no universal agreement on how to integrate residents with dementia within an Extra Care/care home setting and whether people with dementia should live alongside other residents or on a specialist dementia wing/section/floor (Torrington, 2009; Jones and van der Eerden, 2008). Whichever model is used design and management will be important.

The following issues should be considered:

- It is inevitable that some people whilst they are in sheltered housing and Extra Care housing will develop dementia and therefore all sheltered housing, care homes and Extra Care housing should follow this design guidance to provide for people with dementia and sight loss.
- The design of internal and external communal facilities should facilitate integration.
- Take into account the preferences and way of living of different cultures.
- Care plans should be tailored to suit individual needs.
- Integration strategies should consider the needs of people with dementia and sight loss, and those of other residents.

Evidence suggests fully integrated developments have benefits for people with dementia through additional opportunities for stimulation, social integration and support from other residents. Some residents enjoy 'looking after' cognitively impaired friends and acquaintances 'feel useful' – though for some the presence of individuals with dementia can be unpopular and problematic (Housing and Dementia Research Consortium, 2010, p8). However the advantage of integration tends to reduce as the disease progresses (Housing and Dementia Research Consortium, 2010, p9).

In the research we carried out we saw people with dementia interspersed throughout an Extra Care development and the provision of flats for people with dementia set in separate dementia wings within an Extra Care development. Both settings worked well and residents were well integrated. Residents often took part in activities and used facilities such as the internal communal and external areas.

The scheme managers were well informed regarding the needs of people with dementia and sight loss and care plans reflected this. Care plans were tailored to suit individual needs and people with dementia and/or sight loss were well supported by care plans. Residents were also well informed regarding the needs of people with dementia. In one setting residents without dementia regularly escorted people with dementia and sight loss back to their room after meals.

Less successful was the integration of people who developed dementia within sheltered housing. Often other residents were not keen on sharing communal facilities with people with dementia and felt that people with dementia should not be living in sheltered housing. A combination of design and management strategies may enable improved integration.

Geoff Moore details an excellent example of how work within a housing organisation and the Alzheimer's Society has raised staff and resident awareness and altered the attitudes of residents. For further reading please see Partnership creates dementia care synergies in sheltered housing (Moore, 2009).

Section 4 – Management, staff awareness and care plans

This publication has focused on the physical built environment aspects of providing accessible and safe home environments for people with dementia and sight loss. This section will firstly consider how effective management and well trained staff can maintain and enhance accessible environments; and will then turn to other issues related to staff training and care plans for residents with dementia and sight loss and/or hearing loss.

The built environment is just one aspect of a total person-centred care approach. The approach and attitude towards care and the delivery of care are equally or more important than the built environment. The design and layout of buildings should allow, facilitate and add to the quality of care and to the quality of life of the residents, their families and the people who provide care for them.

Many accessible building features could be rendered at best less effective or at worst inaccessible, unless supported by management policies. Staff must be aware of the purpose and use of accessible features in order to ensure they are used and maintained correctly.

Staff training

Alongside providing a suitable built environment that meets the needs of individuals with dementia and sight loss and/or hearing loss, staff training is key to supporting people to live full and independent lives. Within a care home or Extra care scheme it is vital that all staff have training on sight loss, hearing loss and dementia. This will help ensure that the right care is provided to the resident both in terms of the built environment and the care they receive.

In terms of maintaining an accessible environment staff training should include:

- Staff do not move room layouts and furniture
- Staff manage seating arrangements and room layouts to minimise background noise to enable residents to hear

- Cleaning staff are given sight loss awareness training to ensure toilet rolls contrast against their background, flooring is not cleaned with a product that will leave the flooring with a shiny finish and furniture is left in the same position
- Cleaning staff are aware that if they have to temporarily block off an area (For example: wet floor, vacuuming) they ensure residents have a safely navigable route
- Sight loss and dementia training for cleaning staff ensures that when cleaning the room of a resident with dementia and/or sight loss they do not move or tidy away items left in specific places to aid the resident's independence.
- Kitchen staff are trained to ensure when food is plated up that it contrasts against the crockery.

Care staff should be trained to understand an individual's sight loss/and or hearing loss condition and this should be integrated into their care plan. Understanding what is in a person's visual field can help optimise the physical environment, eg, understanding the limitations of some seating configurations, optimise posture to enhance visual field, ensure the best use of vision aids, and ensure meaningful and symbolic objects are within visual range. Training will also help staff to approach and place themselves into the resident's field of vision (Jones and Van der Eerden, 2008, p.13). Equally, training staff to understand someone's hearing loss and what hearing aids and assistance an individual may need can help ensure individuals maximise their remaining hearing (Action on Hearing Loss/Echalier 2012).

Case study – Care home 15 years old

Mrs G, 78 Alzheimer's disease and glaucoma, cataract and blind in one eye.

Mrs G did not like having to be assisted to use the shower or toilet but could not use the facilities unaided. She found the experience frightening as she could not see the people assisting her very well due to tunnel vision caused by her glaucoma, cataracts and lack of sight in one eye.

Staff have changed how they approach Mrs G to ensure they talk to her, explain what they are doing when they enter the room and approach her head on rather than from the side. She is more relaxed when staff explain to her what they are doing and approach her head on so they are within her vision field.

Many individuals with dementia benefit from activities that can be designed around their individual needs. This can help reduce boredom and alleviate certain behaviours associated with dementia, such as wandering. Whilst staff are often time pressured, it is important that they have knowledge and training on engaging with people with dementia, and on activities of interest to individuals with dementia and sight loss to make the best use of the time they have available.

Case study

"There is a lack of stimulation in some care homes especially where there are EMI wards. Carers simply do not have the time or the facilities and training to provide individual or group stimulation." **Carer, EMI ward**

"I would like the facilities and to learn about how to engage people with dementia and sight loss" **Carer, Nursing Home**

Further reading

The Pool Activity Level (PAL) Instrument for Occupational Profiling: A Practical Resource for Carers of People with Cognitive Impairment (Pool, 2012) and PAL Training pack

www.jackiepoolassociates.org

Practice Guidance – Supporting the Social Care Workforce to Deliver Person Centred Care for People with Dementia (Rowett, 2010).

Enriched care planning for people with Dementia: A Good Practice Guide to Delivering Person-Centred Care. (Hazel et al, 2009.)

Coping with dementia: a practical handbook for carers (Health Scotland, 2008).

Policies to promote an accessible environment and ensure residents needs are catered for

Policies should be put in place within each care home to guide staff to promote an accessible environment to support people with dementia and sight loss

For example:

- Ensure regularly updated care plans are in place for each individual.
- Train staff on communication tactics with residents and ensure that staff use these (World of Silence/Echalier, 2012).
- Ensure all staff have dementia and sight loss/hearing loss and dual sensory loss training to ensure all aspects of their job where applicable take into account residents needs.
- External areas and paths should be kept clean, clear of leaves, moss, snow and ice, and headroom maintained by cutting back overhanging branches.
- Waste bins, street furniture and other external obstructions should be kept off access routes and away from drop kerbs. Paths should be regularly maintained, with uneven paving slabs and broken lights replaced.
- Doors and door entry systems should be in good working order.
- Doors to communal and activity areas should be kept open where possible to encourage people with dementia to enter.
- Communal and activity areas are decorated, and furniture arranged, to provide a welcoming homely environment.
- Activity areas, where possible, should have displays of items linked to the current activity to stimulate engagement. This could include some tactile items for people with no useful vision.

- In rooms used for several different activities, items relating to one activity should be put away when the space is used for another activity as leaving out items related to a different activity may confuse some people with dementia
- Storage, planters, bins etc. should not obstruct circulation space, for instance corridors, in WCs and bathrooms.
- Movable features and furniture such as tables and chairs should not become obstructions
- Furniture and room layouts should be kept in permanent positions or moved back to their original position after an activity.
- Room and furniture layouts should be recorded.
- Floor and wall surfaces should be safely maintained. When redecorating, maintain visual contrast between critical surfaces.
- Cleaning and polishing should not produce a slippery surface.
- Windows, blinds and lamps should be kept clean to maximise the available light.
- Burnt-out lamps should be replaced promptly.
- Signs should be replaced correctly when moved for decoration, and be moved when the function or location of an area changes.
- Signs and items near residents doors used for recognition are changed when a resident moves.

Management and staff may add items to the list above specific to their premises

Resident's involvement

Care management should consider how to involve residents with dementia within the day to day activities and running of their home. Research has found that when care home residents are more involved in decisions, this improves their memory, attention and satisfaction with life. In a recent project, some residents were involved in redecorating a communal lounge. These residents reported improved wellbeing, and made more use of the communal space. Moreover the staff found the residents to be more engaged with their environment and the people around them, and be generally happier and have better health.

At the time of writing this publication, Innovations in Dementia CIC are running a two year project (2012-2014). The project is researching what kind of methods and approaches can help care home staff to involve residents with dementia and identify what are the most effective resident engagement activities. For example care home staff have tried activities to engage residents with dementia who do not normally join in activities, such as arranging a pamper session where they enjoyed a foot, hand or face massage, or had their nails painted. Staff said: "We don't often get the time to do this sort of thing. Because they were so relaxed we could connect with them more" (Carehome.co.uk, 2013).

Care plans

It is recommended that a support plan such as the Alzheimer's Society 'This is Me' plan is prepared to inform both existing and new staff on the personal needs and preferences of individuals. Residents should have an individual person-centred plan including a life story. The plan should include a section on sensory loss to ensure that both the care plans and the environment can be adapted to suit an individual's needs. This can be used as a Dementia and Sensory Loss Passport, eg, to inform NHS staff when a person goes into hospital.

Regular sight and hearing screening

Improvements in visual and hearing function have the potential to increase the independence and quality of life of people with dementia and therefore residents should have their eyes and hearing tested every two years. An eye test is not just a test to see if glasses are needed; an eye test is a full health check for eyes. Early signs of sight loss can often be detected during regular eye health tests before symptoms appear. Crucially some of these sight conditions are treatable and further deterioration can be prevented.

Additionally if someone's sight condition and/or hearing loss condition is known, care plans and the environment can be adapted to suit their particular needs.

Individuals with dementia should be screened for sensory loss on a regular basis to ensure that care plans are updated as they progress through the stages of dementia.

For further advice please see:

Dementia and sight loss (RNIB Scotland and Alzheimer Scotland, 2013)

Seeing it from their side: A guide to recognising and supporting sight loss in your care home (RNIB, 2010).

For an initial hearing check, take the free Action on Hearing Loss hearing check. This is not a substitute for a full hearing test; however the results can be taken along to the GP to help them decide whether further testing is needed. You can take the test on the phone or online. Remember to check both ears.

Telephone: Just call **0844 800 3838** (Calls from a BT Landline cost up to 5p/minute. Other providers' charges may be higher and call set up charges may apply). Online: www.actiononhearingloss.org.uk/hearingcheck

Further reading

The World of Silence: the case for tackling hearing loss in care homes (Action on Hearing Loss/Echalier, 2012)

Partnership creates dementia care synergies in sheltered housing. (Moore, 2009)

For information and ideas for carers on adapting an individuals home please see:

At home with Alzheimer's Disease: Useful Adaptations to the Home Environment. Canada Mortgage and Housing Corporation (1990)

Bibliography

Action on hearing loss (2011) Statistics

Online at

www.actiononhearingloss.org.uk/your-hearing/about-deafness-and-hearing-loss/statistics.aspx

Accessed on 10/8/11.

Action on Hearing Loss/Echalier, M. (2012) **The World of Silence: the case for tackling hearing loss in care homes.**

Acoustics at Work (2011) Noise in office environments. **The effects and the means to reduce and controls it.**

Alderson, A. (2010) **Stairs, Ramps and Escalators.** Centre for Accessible Environments and RIBA Publishing, London.

Alzheimer's Association Australia (2000) **Furnishings and décor: The environment and dementia.** Sheet 8.

Alzheimer's Research UK (2011) Dementia Statistics

Online at

www.alzheimer'sresearchuk.org/dementia-statistics

Accessed on 01/01/2011.

Alzheimer's Society (2010a) **Posterior cortical atrophy.** Factsheet 479.

Alzheimer's Society (2010b) **Hallucinations in people with dementia** Factsheet 520. June 2010.

Alzheimer's Society (2011a) **What is dementia?** Factsheet 400. April 2011.

Alzheimer's Society (2011b) **What is vascular dementia?** Factsheet 402. July 2011.

Alzheimer's Society (2012) **Sight, perception and hallucinations in dementia.** Factsheet 527.

Armstrong, R. (2003) **Dementia with Lewy Bodies: A new type of dementia with visual symptoms.** Optometry. January 10 pp39-41.

Association of Chief Police Officers (2004a). **Secured by Design – Principles.** ACPO, London.

Association of Chief Police Officers (2004b). **Secured by Design – Sheltered Housing**. ACPO, London.

Association of Chief Police Officers (2009). **New Homes 2010**. ACPO, London.

Bakker, R. (2003) **Sensory Loss, Dementia and Environments**. Journal of the American Society of Aging. Spring 2003.

Barker, P. and Fraser, J. (2000) **Sign Design Guide: a guide to inclusive signage**. JMU and the Sign Design Society.

Beech, R. and Roberts, D. (2008) **Assistive technology and older people. Research Briefing**. No. 28. August 2008. Social Care Institute for Excellence.

Bell, V. and Troxel, D. (2011) **An Overview of the Best Friends Approach to Alzheimer's Care**. 2011 Health Professions Press, Inc.

Bonewitz, Dr. R. (2000) **The complete book of colour healing: how to enhance your physical and spiritual well-being**. Godsfield Press Ltd.

BREEAM (2008) **Multi-residential 2008: Scheme document 5064**. BRE Global Limited.

BREEAM (2011) **New Construction: Non Domestic Buildings Technical Manual**. SD5073 332011. BRE Global Ltd.

Bright, K and Cook, G. (2010) **The Colour, Light and Contrast Manual: Designing and Managing Inclusive Built Environments**. Wiley-Blackwell, Oxford.

Briller, S. Proffit, M., Perez, K. and Calkins M. (2001) **Volume one. Creating successful dementia care settings: Understanding the environment through aging senses**. Developed by Calkins, M. Health Professionals Press.

British Standard Institute (BSI) (2008) **BS8493: 2008 Light Reflectance Values: Method of Test**. British Standards Institute: London.

British Standard Institute (BSI) (2010). **BS 8300: 2009 + A1 2010 Design of buildings and their approaches to meet the needs of disabled people – Code of practice**. British Standards Institute: London.

Bruce, I.W., McKennell, A.C. and Walker, E.C. (1991). **Blind and partially sighted adults in Britain: the RNIB survey Volume 1**. London. HMSO.

Calkins, M. (2002) **Colour throws light on design in dementia**. Journal of Dementia Care. Vol. 10 PT. 4. pp20-23.

Canada Mortgage and Housing Corporation (1990) **At home with Alzheimer's Disease: Useful Adaptations to the Home Environment**. Canada Mortgage and Housing Corporation.

CAPIC (2002). **Proposals for injury prevention in Wales**. Cardiff, CAPIC.

Carehome.co.uk (2013) Care UK and MHA are giving people with dementia more say in running their care homes

Online at

www.carehome.co.uk/news/article.cfm/id/1558311/care-uk-and-mha-are-giving-people-with-dementia-more-of-a-say-in-running-their-care-home

Accessed on 30/07/09.

Caregiving with purpose (2012) How Can Reducing Visual Clutter Help Someone with Alzheimer's Symptoms?

Online at

<http://caregivingwithpurpose.com/5735/alzheimer's/how-can-reducing-visual-clutter-help-someone-with-alzheimer's-symptoms/>

Accessed on 20/02/2013.

Centre for Accessible Environments/RIBA (2006) **Specifiers Handbook for Inclusive Design. Glass in Buildings**. RIBA Publishing: London.

Centre for Accessible Environments/Grant. A (2012). **Designing for Accessibility: 2012 Edition**. RIBA Publishing: London.

Chaplin, A. (2011) **Better than cure: Spending money on aids to prevent older people having to go in care will save money in the long term**. **Inside Housing**. 8 July 2011, p17.

CIBSE (2012) **The Society of Light and Lighting Code for Lighting**. Society of Lighting and Lighting.

Cohen, U. & Wiseman, G. D. (1991) **Holding on to home: Designing environments for people with dementia**. Baltimore. John Hopkins University Press. Cited in Chaudery, K. (2005) Publication Review: Design for Dementia. June 2005. HMMInfoNewsletter. The University of Sydney: Faculties of Sciences and Architecture.

Collaboration for Accident Prevention and Injury Control (CAPIC) (2002) **Proposals for Injury Prevention in Wales**. March 2002.

Cummings SR and Melton III LJ (2002). **Epidemiology and outcomes of osteoporotic fractures**. The Lancet; 359: 1761-1767.

Dalke, H., Corso, A., Stott, L. Dismohamed, H. and Hunt, R. (2010) **Living with Dementia: Can design make a difference?** Kingston University.

(DCLG) Department for Communities and Local Government (2010) **Code for Sustainable Homes: Technical Guide November 2010**. Communities and Local Government publications.

Dementia Guide (2011a) About Dementia. Types of Dementia. Parkinsons disease. February 2011
Online at www.dementiaguide.com/aboutdementia/typesofdementia/parkinsons/ Accessed on 27/7/11.

Dementia Guide (2011b) About Dementia. Types of Dementia. Dementia with Lewy bodies. February 2011
Online at www.dementiaguide.com/aboutdementia/typesofdementia/lewy_bodies/ Accessed on 27/7/11.

(DETR) Department of the Environment, Transport and the Regions (1999) **Guidance on the use of tactile paving surfaces**. Mobility and Inclusion Unit, London.

(DSDC) Dementia Services Development Centre, Joint Improvement Team (2010) **Telecare and Dementia: Using telecare effectively in the support of people with dementia**. Dementia Services Development Centre, Stirling University.

Dunne, T., Nearing, S., Cipolloni, P. and Cronin-Golomb, A. (2003) **Visual contrast enhances food and liquid intake in advanced Alzheimer's disease**. Clinical Nutrition. Vol. 23, pp 533-538.

Eiseman, L. (2006) **Color: messages and meanings, A Pantone Colour Resource**. Handbooks Press, Gloucester, USA.

Goodman, C. (2011) **The Lifetime Homes Design Guide**. Habinteg Housing Association.

Goodman, C. and Watson, L. (2010a) **A comparative review of design guidance for people with dementia and design guidance for people with sight loss**. A report prepared by Habinteg Housing Association for Thomas Pocklington Trust.

Goodman, C. and Watson, L. (2010b) **Design guidance for people with dementia and for people with sight loss. Research Findings No 35**. Review carried out by Habinteg Housing Association for Thomas Pocklington Trust.

Hazel, M., Edwards, P. and Brooker, D. (2009) **Enriched care planning for people with Dementia: A Good Practice Guide to Delivering Person-Centred Care**. Jessica Kingsley publishers, London.

Health Scotland (2008) **Coping with dementia: a practical handbook for carers**. www.healthscotland.com.

Help the Aged (2006) **My Home Life Wales: Quality of life in care homes. Executive Summary**. Help the Aged.

HM Government (2010) **Approved Document M – Access to and Use of Buildings**.

HM Government (2013) **Approved Document M – Access to and Use of Buildings**.

Hornung, D. (2006) **Colour: A workshop for artists and designers**. Laurence King Publishing Ltd: London.

Housing and dementia research consortium (2010) **Living Beyond Dementia: a guide to dementia and Housing with Care**. MHA Care Group.

Jones, G. and van der Eerden, W. (2008) **Designing care environments for persons with Alzheimer's disease: visuo-perceptual considerations**. *Clinical Gerontology*. 2008 18. pp13-37.

Jones, G., van der Eerden-Rebel, W. and Harding, J. (2008) pp1-57 in Mieson, B. and Jones, G. (2008) **Care giving in Dementia**. Routledge. London.

Jones. Professor R. and Trigg. Dr. R. (2007) **Dementia and serious sight loss**. Occasional paper February 2007, Number 11. Thomas Pocklington Trust, London.

King's Fund (2001) Consultation Meeting on Assistive Technology, London, King's Fund. Cited in Beech, R. and Roberts, D. (2008) **Assistive technology and older people. Research Briefing. No. 28**. August 2008. Social Care Institute for Excellence.

Knapp, M. and Prince, M. (2007) **Dementia UK The Full Report**. Alzheimer's Society, London.

Lawrence, V.; Murray, J.; Banerjee, S.; Fffyyche, D. Dr (2008) **The experiences and needs of people with dementia and serious visual impairment: a qualitative study. Occasional paper No. 16**. Thomas Pocklington Trust, London.

Lifetime Homes (2013) 16 Design Criteria from 5 July 2010 (revised) Online at www.lifetimehomes.org.uk/pages/revised-design-criteria.html Accessed on 15/01/13

Nicholson, A., Cameron, C. and Mountford, N. (2008 2nd Edition) **Design Principles for Extra Care Housing Care Services: Improvement Partnership/Housing Learning and Improvement Network**.

Nolan, B., Mathews, M. Truesdell-Todd G. and VanDorp, A. (2002) **Evaluation of the effect of orientation cues on wayfinding in persons with dementia**. Alzheimer's Care Quarterly. Vol 3 Part 1 pp46-49.

Manke, F. (1996) **Colour, Environment and Human Response An Interdisciplinary Understanding of Color and its Use as a Beneficial Element**. John Wiley and Sons, Inc: New York.

Mardon, C. (2012) Busy rooms 'hurt dementia patients'. Illawarra Mercury. Online at www.illawarramercury.com.au/story/416354/busy-rooms-hurt-dementia-patients/?cs=300
Accessed on 20/02/13

Marshall, M. (2010) **Designing balconies, roof terraces and roof gardens for people with dementia**. Dementia Services Dementia Centre. University of Stirling.

McManus, M. and McClenaghan, C. (2010) **Hearing, sound and the acoustic environment for people with dementia**. Dementia Services Development Centre. University of Stirling.

Mendez, M., Cherrier, M., & Meadows, R. (1996). **Depth perception in Alzheimer's disease**. *Perceptual and Motor Skills*, 83, 987-995.

Moore, G. (2009) **Partnership creates dementia care synergies in sheltered housing**. *Journal of Care Services Management*, 3.3, pp247-249.

Morioka, A. and Stone, T. (2006) **Color Design Workbook: A Real World Guide to Using Color in Graphic Design**.

Pankow, L. Pliskin, N. and Luchins, D. (1996) **An optical intervention or visual hallucinations associated with visual impairment and dementia in elderly patients**, *Journal of Neuropsychiatry*, 8: 13-37. Cited in Alzheimer's Society (2010b) Visuo-perceptual difficulties in Dementia. Factsheet 479. June 2010.

Parkinsons (2011a) **Parkinsons Dementia factsheets**.

Parkinsons UK (2011b) **Hallucinations and delusions in Parkinson's Factsheet**.

Peel N.M., Kassulke D.J. and McClure R.J. (2002). **Population based study of hospitalised fall related injury in older people**. *Injury Prevention* 8: 280-3. cited in NHS Wales/WG (2011) National Prevention and Promotion Programme: Final Report and Recommendations.

Perkins, B., Hogland, D., King, D. and Cohen, D. (2004) **Building Type Basics for Senior Living**. John Wiley and Sons Inc. Hoboken, New Jersey.

Pichora-Fuller, M.K. and Carson, A.J, (2001) **Hearing health and listening experiences of older people communicators (pp43-74)** in Hummert, M.L. and Nussbaum J. F. (eds.) **Ageing, Communication and Health, linking research and practice for successful aging**. Lawrence Erlbaum Associates Publishers: London. Cited in McManus, M. and McClenaghan, C. (2010) **Hearing, sound and the acoustic environment for people with dementia**. Dementia Services Development Centre University of Stirling.

Pollock, R. (2003) **Design of Interiors, Fixtures and Fittings for People with Dementia**. University of Stirling, Scotland.

Pollock, R., McClair, D. McGuire, B. and Cunningham, C. (2008) **Designing Lighting for People with Dementia**. The Dementia Services Development Centre, University of Stirling/The Institution of Lighting Engineers.

Pool, J. (2007) **The Alzheimer's Society Guide to the Dementia Care Environment**, The Alzheimer's Society.

Rees, L. and Lewis, C. (2003) **Housing Sight: A guide to providing accessible homes for people with sight problems**. RNIB and the Welsh Government.

Rees, L. and Lewis, C. (2004) **Adapting homes – guidance for adapting existing homes**. Welsh Government.

RNIB (2002) **Effective Communications Pack**.

RNIB (2006) **See it Right: Making information accessible for people with sight problems**. RNIB London.

RNIB (2010) **Seeing it from their side: A guide to recognising and supporting sight loss in your care home**. RNIB.

RNIB and Thomas Pocklington Trust (2009) **Double trouble: dementia and sight loss**. October 2009.

RNIB and Thomas Pocklington Trust (2012) **Make the most of your sight – Improve the lighting in your home**. Third edition. RNIB and Thomas Pocklington Trust.

RNIB Cymru/John, J. (2007) **Colour and tonal contrast: The process from guidance to accessible housing, a supplement to "Housing Sight"**. RNIB Cymru.

Rospa (2013) Accidents to Older People Online at www.rospa.com/homesafety/adviceandinformation/olderpeople/accidents.aspx

Accessed on 23/7/13

Rubenstein L.Z. and Josephson K.R. (2002). **The epidemiology of falls and syncope**. Clinical Geriat Medicine 18: 141-58 cited in NHS Wales/WG (2011) National Prevention and Promotion Programme: Final Report and Recommendations.

Rumney (1992) **Low vision aids in practice**. Optometry today. 21 Sept.: 23-30.

Sense (2010) A sense of urgency.

Online at www.sense.org.uk/publications/sense-urgency

Accessed on 27/8/2013

Sixsmith, A., Gibson, G., Orpwood, R. and Torrington, J. (2007) **Developing a technology "wish-list" to enhance the quality of life of people with dementia**. Ageing and Society, Vol 24, No. 6. pp9410962. Cited in. Torrington, J. (2009) Extra Care housing: environmental design. Journal of Care Services Management, Vol. 3, Number 3, April 2009, pp 250-258.

Sloane P.D., Rader, J., Barrick A.L., Hoeffler B., Dwyer S., McKenzie D., Lavelle M., Buckwalter K., Arrington L. and Pruitt T. Cited in Bakker, R. (2003) **Sensory Loss, Dementia and Environments**. Journal of the American Society of Aging. Spring 2003.

Social Care Institute for Excellence, ARUP and the Thomas Pocklington Trust (2012) **Dementia and end of life care: implications for people with sensory loss: Report from a half-day seminar on 7 February 2012**. SCIE: London.

Spears, P. (undated) **Design for Dementia Care**. Presentation.

Stone, T., Adams, S. and Morioka, N. (2006) **Color Design Workbook**. Rockport Publishers, Massachusetts.

Surface (2012) **Inclusive Design for Getting Outdoors DSOPM003: Tactile paving**.

Thomas Pocklington Trust (2010) **Good Housing Design Lighting – A guide to improving lighting in existing Homes.** Good Practice Guide 5. Thomas Pocklington Trust.

Thomas Pocklington Trust and Habinteg Housing Association (2008) **Housing for People with Sight loss: A Thomas Pocklington Trust design guide.** IHS BRE.

Thorpe, S. and Habinteg Housing Association (2006) **Wheelchair Design Guide.** BRE Press and Habinteg Housing Association.

Timlin, G. and Rysenbury, N. (2010) **Improving Dining and Bedroom Environments in Care Homes.** Helen Hamlyn Centre, London.

Torrington, J. (2009) **Extra Care housing: environmental design.** Journal of Care Services Management, Vol. 3, Number 3, April 2009, pp 250-258.

Welsh Government (2005) **Development Quality Requirements, Design Standards and Guidance, 2005.**

Welsh Government (2006) **Guidelines for Developing Extra Care Housing in Wales.**

Welsh Government (2008) **The Welsh Housing Quality Standard revised guidance for Social Landlords on interpretation and achievement of the Welsh Housing Quality Standard.**

Welsh Government (2009) **Technical Advice Note 12: Design.**

Welsh Government (2010) **Improving lives and communities: Homes in Wales.**

Welsh Government and the Alzheimer's Society (2011) **National Dementia Vision for Wales: Dementia Supportive Communities.**

Welsh Government (2012) **Planning Policy Wales Edition 5, November 2012.**

Welsh Local Government Association/RNIB/Action on Hearing Loss and Sense (2012) **Sensory loss in the adult population in Wales.**

