

**Dementia Collaborative Research Centre  
Assessment and Better Care Outcomes**

**Summary**

**Project Title:** A review of the empirical literature on the design of physical environments for people with dementia.

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In her influential statement on designing environments for people with dementia Professor Mary Marshall of the Dementia Services Development Centre in the University of Stirling, Scotland recommended that dementia specific residential facilities should :

- Be small in size and
- Domestic and home like;
- With scope for ordinary activities (unit kitchens, washing lines, garden sheds);
- Include unobtrusive safety features;
- Have rooms for different functions with furniture and fittings familiar to the age and generation of the residents;
- Provide a safe outside space;
- Have single rooms big enough for a reasonable amount of personal belongings;
- Provide good signage and multiple cues where possible; eg. sight, smell, sound;
- Use objects rather than colour for orientation;
- Enhance visual access, i.e. ensure that the resident can see what they need to see from wherever they spend most of their time; and
- Control stimuli, especially noise. (Marshall 2001).

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This report reviews the literature relevant to these recommendations. The 148 relevant articles located were reviewed using a process that assesses the strength of the methodology used (Forbes 1998). 57 were considered to have a sufficiently strong methodology to be included in this review.

There is good evidence that unobtrusive safety features improve resident well being, especially by reducing depression (Wells and Jorm 1987; Zeisel, Silverstein et al. 2003) . However an over emphasis on safety may have a detrimental effect (Torrington 2006). There is also good evidence for the provision of a variety of spaces in environments for people with dementia as they assist in reducing anxiety and depression while improving social interaction and may assist the resident to find their way around (Zeisel, Silverstein et al. 2003). The availability of single rooms for people with dementia appears to be beneficial (Morgan and Stewart 1998; Zeisel, Silverstein et al. 2003).

The careful optimisation of levels of stimulation is well supported (Cleary, Clamon et al. 1988.; Cohen-Mansfield and Werner 1995; Zeisel, Silverstein et al. 2003). Methods of dealing with specific elements of the environment that cause over-stimulation, e.g. hiding or disguising busy entry doors that provide a view to the outside, have been thoroughly investigated and found to be effective (Namazi, Rosner et al. 1989; Dickinson, McLain-Kark et al. 1995). While it is necessary to reduce unhelpful stimulation care must be taken to optimise helpful stimuli. There is good evidence to show that increasing levels of illumination beyond that which is usually considered to be normal can improve sleep patterns and reduce behavioural disturbance (Thorpe, Middleton et al. 2000; Ancoli-Israel, Gehrman et al. 2003; Sloane, Christianna et al. 2007).

The evidence for the incorporation of good visual access, i.e the opportunity for the resident to see all of those things and places that she wants to access, on the unit level scale is not strong (Elmstahl, Annerstedt et al. 1997; Passini, Pigot et al. 2000) but the dramatic effect of making an important amenity, the toilet, easily seen provides good supporting evidence for the concept (Namazi and Johnson 1991a) .

While there is evidence supporting the proposition that small size is associated with a variety of positive outcomes for people with dementia it is impossible to quantify the contribution that the size of the unit makes in comparison with the other environmental factors that are commonly associated with a purposely designed, small unit e.g. homelikeness, safety and familiarity (Reimer, Slaughter et al. 2004). The same problem of an intricate relationship between the social/professional environment, i.e philosophy of care, staff skills, good management practices, and the physical environment make it difficult to conclude that a homelike physical environment has a broad impact, especially in the case of people with advanced dementia. However there is good evidence that it reduces aggression (Zeisel, Silverstein et al. 2003).

There is moderately strong evidence for the beneficial effects of providing people with dementia with an environment that gives them an opportunity to engage in ordinary activities of daily living (Melin and Gotestam 1981.; Reimer, Slaughter et al. 2004) However it is very difficult to differentiate the contribution of the physical environment from that of the staff encouragement and support. There is little evidence for the benefits of outside spaces by

themselves but good evidence of benefit when combined with staff interaction (Cox, Burns et al. 2004). The evidence for the beneficial effects of signage is not strong (Hanley 1981; Namazi and Johnson 1991b) and no empirical support was found for the use of the display of personal memorabilia as aids to orientation.

The fact that the evidence for a particular design principle is weak at the moment is at least as much a criticism of the research carried out to date as it is a negative comment on the design principle. Researchers are only just starting to develop methodologies that can cope with the complexities of the inter-relationships between the physical environment and the care that takes place within it. At the moment we can say with a reasonable level of certainty that designers and architects may be confident about using unobtrusive safety measures; varying the ambience, size and shape of spaces; providing single rooms; maximizing visual access to important features and providing for stimulus control with the periodic availability of high levels of illumination. Indeed these features could be seen as essential attributes of all physical environments that have a claim on being designed specifically for people with dementia.

The finding that there is a reasonably substantial body of literature on the design of environments for people with dementia, that the methodologies in use are increasing in sophistication and that there are very few findings that contradict the general thrust of the schema provided by Marshall suggests that we are moving in the right direction. There are however significant gaps in the research effort.

The most obvious gap remains the question of the relative contribution of the environment and staff – resident interactions to high quality outcomes. To put it another way – can high quality outcomes be delivered by staff in low quality environments?

This review identifies the need for better research into the questions of the effects of size, homelikeness and access to ordinary activities on people with dementia. As these are central to many of the approaches to design current in Australia it would be useful have a better understanding of their importance.

Cultural heritage is an integral part of the self-identity of older people, including, and perhaps especially, those with Alzheimer's disease and other dementias (Valle 1989) reported in (Day and Cohen 2000). When ignored it may be a barrier to the provision of high quality care. 'Culture has been largely neglected, however, in the design of environments for people with dementia.' (Day and Cohen 2000). The cosmopolitan nature of Australian society and the consequent increase in the number of people with dementia from a variety of cultural backgrounds demands that attention be given to the investigation of culturally appropriate environmental designs.

Research on designing for remote indigenous communities might benefit from being placed within a broader category of design for rural and remote aged care services where the care of people with dementia forms part of the aged and healthcare services. The mix of residents and patients; difficulties in recruiting and retaining staff; accessing high quality assessment and management advice provide challenges for service delivery that may, in part, be addressed by the development of special physical environments.

Much of the research focuses on interventions that are useful to mobile people with dementia. There is a great need to research the environmental aspects of providing care to people in the later stages of the disease characterized by immobility, lengthy periods in bed and end of life issues.

Towards the other end of the age spectrum younger people with dementia may require a variation on the environments that have been found to be successful for the older person with dementia. Investigations of the impact of providing environments that are in keeping with the expectations of younger people and provide up to date information technology may help to guide the development of this neglected area.

People with Down's syndrome develop Alzheimer's disease if they live to a normal old age. More of them are doing so. However the links between services for these people and dementia services is very weak despite the fact that much of the early work on caring for people with dementia used approaches developed for people with developmental disability. Joint work on environmental design might enrich both fields.

The available research suggests that unobtrusive safety features, e.g. hidden exits, reduce depression. This raises the interesting question of what would happen if the physical safety features were taken away altogether and replaced with additional staff attention and community awareness?

In an early statement of the principles of good design for people with dementia (Fleming 1987) it was stated that facilities should be placed close to the community of origin of the person because the identity of a person who has lost their recent memories can be more easily supported by familiar sights and visits from friends and relatives when they are living close to that community. The relationship between the purpose designed unit and the local community has received very little attention in Australia and no systematic evaluation of environmental interventions to improve the relationship were discovered during the course of this review. The design of large retirement villages may well be improved by a better understanding of this relationship and of how to build environments that maintain links with the community without stressing either those with dementia or those living alongside them.

It is clear that there is a great deal of interesting work yet to be done.

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