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# **Evidence-based design for dementia**

*Findings from the past five years*

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There is growing evidence that the design of the built environment, by itself and in combination with organizational policies and procedures, has a direct and measurable impact on the physical and psychosocial functioning of residents with dementia, which may translate into higher quality of life. Traditionally, the physical environment has not been considered an active component of treatment. Fortunately, this is beginning to change.

There were three excellent reviews of research on shared residential/long-term care environments for people with dementia published between 2000 and 2002<sup>1-3</sup> and one in 2009.<sup>4</sup> The chapter by Day and Calkins<sup>1</sup> included not only what the research literature reports, but whether and how that information was informing the actual design of long-term care settings for people with dementia. Rather than replicate what has already been published, this article will focus primarily on research conducted since these reviews. Readers seeking more detailed information on these studies can contact the author.

## **HOUSEHOLD OR GROUP SIZE**

The trend over the past two decades has been to reduce the size of the "nursing unit" from 60 "beds" to households accommodating anywhere from 9 to 24 residents. Larger units are associated with poorer resident outcomes including higher agitation and aggressiveness, faster intellectual deterioration, higher rates of depression, and greater psychotropic and antibiotic medication use. Smaller units appear to have a number of positive benefits such as higher motor functioning; greater friendship formation; less anxiety, sadness, and depression; more positive activity involvement; and greater mobility. Research conducted on the Green House model has found greater quality of life on 7 of the 11 MDS domains, greater emotional health, and greater satisfaction with the nursing home as a place to live.

Interestingly, residents of the smaller Green House homes were significantly less likely to participate in structured activities than residents of the traditional homes. However, Green House residents also had significantly lower levels of depression and late-life loss of activities of daily living. Other studies have found that staff in larger units feels more ressure, regardless of residents' need for physical or psychosocial assistance. Smaller units, conversely, are less stressful for staff, allowing them to have better interactions with residents, which can improve their quality of life.

## **NONINSTITUTIONAL VS RESIDENTIAL DESIGN**

It is interesting to note the prevalence of the term "noninstitutional" in describing the interior decor of nursing homes. This term is used frequently in the literature. Yet to design the "non" of something doesn't indicate what the design should be; only what it shouldn't be. The assumption is that people will know and agree on what "noninstitutional" means, which is far from the case. Some designers and researchers who study these settings suggest more "homelike" furniture, which presumably means elements such as wood or upholstered covering versus metal and/or plastic, and a style that people recognize as being one that someone might put in one's own home (regardless of the fact that furniture style in people's homes varies tremendously).

Others argue that it is color and pattern-that "institutional" is monotonous, and therefore nonresidential is colorful and with patterns. Still, others suggest it means the inclusion of residents' own belonging and furniture-although this is generally limited to the residents' bedrooms, not shared social spaces. While the research in this area is limited, positive outcomes, such as improved intellectual and emotional well-being, reduced agitation, and

improved functionality generally appear to be associated with these noninstitutional environments.

## **WAYFINDING**

Early studies on orientation revolved around signage and identified that personalized and/or unique signage assisted residents in locating desired destinations. Researchers studied newly admitted residents with dementia and noted that learning new routes was a slow process.<sup>5</sup> Residents who could not identify paths to desired locations exhibited anxiety, confusion, mutism, and even panic. Some residents perceived high-contrast patterns on the floor as a barrier. They also noted that the typical location of signs (at heights specified by the Americans with Disabilities Act guidelines) is often not seen by residents whose visual field is low to the ground.

## **BEDROOMS**

There is a growing trend in the design of nursing homes and assisted living settings for the provision of a greater number of private rooms. Several studies suggest that when residents with dementia moved from shared to private rooms, sleep improved, resident-to-resident conflicts were reduced, there was less rummaging behavior, and the use of psychotropic medications was reduced. There is evidence of strong positive psychosocial outcomes (increased preference and satisfaction, more positive visiting, less problems with incompatible roommates), better clinical outcomes for nosocomial infections and reduced hospitalizations, operational savings related to reduced marketing time/costs for private rooms, and reduced staff time for cleaning rooms and bathrooms. Evidence on sleep and falls is inconclusive.

Another researcher has found preliminary evidence of reduced staff turnover in units/households that have a higher percentage of private rooms, suggesting the staff feel less stress when they do not have to spend a great deal of time managing roommate conflicts.

## **LIGHTING**

The majority of research on lighting over the past five years has focused on the impact of bright light on nighttime sleep and daytime engagement and agitation. In these studies, bright light is delivered at different times (morning, midday, and evening), may have different color temperature (cooler or warmer), may be natural light (sunlight) or electric, and exposure ranges from 20 minutes to two hours. Results of these studies vary, with some showing positive results and others having no impact. Two studies explored increasing the amount of ambient light to around 2500 lux (roughly 250 foot-candles), and found improvements in sleep and a 47% to 55% reduction in disruptive behaviors.

## **OUTDOOR AREAS**

There has been an explosion in publications on the importance of outdoors spaces for elders in shared residential settings over the past five years. Unfortunately, few of these have focused on individuals with dementia, and many are descriptive or preference-based. There have been two studies that compared sleep and agitation of residents who spent time outdoors doing activities against residents who did activities indoors. Both studies found a modest improvement in sleep, while one found that residents in the outdoor activity group had an increase in verbal agitation.

## **SAFETY**

Falls are an increasing concern because of both their prevalence and the high costs of care associated with them. It is estimated that 89% of residents with dementia in long-term care have some degree of mobility impairment. Research shows that falls are most likely to occur at night when residents are trying to get out of bed to use the bathroom. There is clear and convincing evidence that the use of bedrails, which are designed to prevent injury to residents, are associated with greater fall and fall-injury risk. Most research on fall interventions takes a multimodal approach, and thus it is impossible to determine the specific impact that environmental interventions have compared to biobehavioral or clinical/pharmacologic interventions. Environmental interventions that have

been explored and found to be effective in combination with other interventions include repositioning furniture, using floor mats to cushion falls, anti-slip mats to improve traction, and improved lighting-especially at night. More research is needed in this important area.

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## References

Day K, Calkins MP. Design and Dementia, in: R.B.A. Churchman (Ed.), Handbook of Environmental Psychology, John Wiley & Sons, New York, 2002.

Day K, Carreon D, Stump C. The Therapeutic Design of Environments for People With Dementia: A Review of the Empirical Research, The Gerontologist 2000; 40:397-416.

Maslow K, Ory M. Review of a Decade of Dementia Special Care Unit Research: Lessons Learned and Future Directions, Alzheimer's Care Quarterly 2001; 2:10-16.

Calkins MP. Evidence-based long term care design, NeuroRehabilitation 2009; 25:145-54.

Passini R, Pigot H, Rainville C, Tetreault MH. Wayfinding in a Nursing Home for Advanced Dementia of the Alzheimer's Type, Environment & Behavior 2000; 32:684-710.

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