



O N E

LONG-TERM CARE

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The Census Bureau data released September 27, 2007, showed that 7.4 of those 75 and older lived in nursing homes in 2006. However, that is down from 10.2 percent in 1990. Today 4.4 percent (1.57 million) are still living in institutionalized settings according to the U.S. Department of Health and Human Services Administration on Aging.¹ In addition to those living in institutional settings, it is estimated that 95.5 percent of older persons may be in need of varying levels of long-term care services. These services vary across the states and many in need fall through the cracks in the system.²

Many residents of long-term care facilities are moved several times through what has been termed the “spectrum of long-term care” as the resident’s condition changes or requires more care. A resident may move from independent living, to assisted living, and then on to a nursing home when the resident requires 24-hour medical care and perhaps hospice services. The continuing care model does not minimize the relocations, but restricts those relocations within the community. However, “aging in place,” a concept whereby the management of long-term care services provide a much needed opportunity for older people to live independently in their communities, can be supported by design that contributes to independence, providing safe and comfortable homes to live out the rest of their lives.

The number of Americans 85 years and older is expected to increase from 4.2 million in 2000 to 5.7 million in 2010 and then projected to increase to 12.9 million by 2020. This will represent over 23 percent of the elderly.³ Unfortunately, only 9 percent of the 3.7 million older persons enrolled in Medicare received care from service provider agencies. Most rely on families and friends to provide necessary caregiving.⁴ Statistics like these underscore the importance

of making long-term care services available and providing design interventions to age in place and avoid institutionalization.

Furthermore, the number of children and adolescents with severe long-term health conditions and adults with physical and developmental disabilities continues to grow. Of people 6 years and older, 11 million needed personal assistance with one or more activities of daily living (ADLs) or instrumental activities of daily living (IADLs). Among people aged 65 and older, 51.8 percent had a disability; and about 36 percent had a severe disability.⁵ Among the population 15 years and older, 3.4 percent had a visual impairment; while an estimated 3.4 percent of people aged 15 and older had a hearing impairment.⁶

QUALITY OF RESIDENTIAL LONG-TERM CARE

Research has shown that emotional stressors may influence the immune response to bacteria, thereby making the resident vulnerable to disease.⁷ High-quality home care may prevent the need for institutionalization and the associated stressors. Geriatric evaluation and diabetic assessment services provide in-home assessment and referral to community services. These services are offered in the home by some geriatric physicians, registered nurses, home health aides, medical social workers, and therapists. Home therapies are becoming commonplace, including provision of pain management, dressing and wound care, ventilation therapy, and phototherapy for jaundice. Physical and occupational therapy account for about 10 percent of the services in the home.

Technology also supports activities of daily living. Examples include heart monitors and

glucometers; active devices that perform therapy on users (home dialysis systems, perfusion pumps, drug delivery systems, and oxygen systems); and general assistance and monitoring devices such as fall detectors and pill-minders.

Another important component supporting home care is home modification. This may include nonmedical equipment for lifting, mobility, special chairs, rails, ramps, adapted toilets, showers and baths, beds, and adapted kitchen design. Through housing design and supportive technology, individuals can function with a higher level of independence, and the demand for staff assistance may be reduced.

DESIGN INTERVENTION

Consumers are increasingly demanding more options for senior housing and residential care. In most communities these choices are limited to (1) independent living, (2) assisted living, and (3) skilled nursing care. CCRCs integrate all three, moving residents from independent living to assisted living when activities of daily living become challenging, then to skilled nursing when significant medical challenges require full-time care.

In contrast, aging in place allows the resident to stay in the same place and have services delivered to the resident. However, the choice for residential long-term care is a personal one, a decision made by the individual or with family members and their medical professionals to determine the level of care needed and the type of residential living that is appropriate. Such choices might include:

1. Community-based group homes
2. Foster homes

3. Supervised apartments
4. Shelters
5. Housing with live-in roommates
6. Host homes where the resident becomes part of the family
7. Boarding houses
8. Shared homes
9. Semi-supervised apartments (without live-in managers)
10. Subsidized support programs where individuals receive payments to follow a plan for self-sufficiency (or discounts on insurance for healthy houses and healthy habits)

These choices support all ages and financial abilities. A team of professionals can help with a seamless transition by providing a “needs assessment,” modification when necessary, and assisting devices. The team may include an occupational therapist, social worker, architect, and interior designer.

The design of a residence can significantly affect care. Many long-term care services can be eliminated by making changes in a person’s dwelling.⁸ In addition, studies show design elements influence the ease with which long-term services can be provided in the home.⁹ For older people, design improves ability to adapt to and recover from stressful activity. It also maximizes the use of existing mobility as well as the auditory, visual, and tactile senses.

Forty percent of deaths from injuries to people 65 and over result from accidents at home. Tripping, fire safety, handrails, lighting, hot water temperature, HVAC (heating, ventilation, and air conditioning), kitchen safety, and security are issues that become critical for long-term care. Research confirms that the most important issues for older people involve health and security. A survey of 500 southern California

seniors (over the age of 65) showed that the most requested features were 24-hour security on the premises, an arrangement with the local hospital, an attendant on the premises trained in cardiopulmonary resuscitation (CPR), emergency call systems, and a television security system in the building.¹⁰

TECHNOLOGY

Communication tools are truly important for those with decreased mobility. Audiovisual and communication devices can connect residents to family and friends, preventing loneliness and a connection to care providers to provide a safe feeling. Commonplace technologies like personal computers with a camera and sound can also be used by providers to monitor patients and to improve diagnosis and treatment in the home. It can provide patients and their families with access to records, and the best medical expertise and information on specific illnesses.

Smart technologies help older people and people with disabilities live independently in their homes by offering services to aging in place residents including safety monitoring, social alarming, sensor alarming (smoke, CO, house-breaking), medical monitoring (telemedicine), functional management of comfort (remote operation of lights, curtains, doors, etc.), energy management, and multimedia and entertainment.

RESIDENTIAL LONG-TERM CARE IN OTHER COUNTRIES

The argument for home care is strong. It prevents or postpones institutionalization, promotes healing, allows for freedom of the individual, and

home care is personalized, tailored to meet the specific needs of each individual. The aim of home care is to meet health and social needs of individuals with high-quality home-based health care and social services. This may include formal and informal caregivers and the use of technology when appropriate.

In Europe, home health care is practiced differently around the region. Because of this, evidence about the appropriateness and effectiveness of home care is diverse and complex, making it difficult to gather and analyze data to make informed decisions. Improvements in public health to identify noncommunicable diseases have contributed to the demand for home care, especially for treatment of mental illness, dementia, and Alzheimer's disease, and chronic illnesses more people are living with such as diabetes, heart disease, respiratory disease, stroke, and cancer. According to the World Health Organization (WHO), with the appropriate and targeted support, these illnesses could be effectively and efficiently taken care of at home.¹¹

Home health care in France had an early start but is limited in its development. Since 1957, when home health care was an experiment to reduce the pressure on hospital beds, it has been an option, but mostly considered secondary rather than an alternative to hospitalization.¹² Patients with mental illness, infectious diseases, and chronic respiratory or renal failure are not eligible for hospitalization at home. However, 60 percent of all elderly people utilize home care services either through a nurse's aide or household help. In France, patients have direct access to national funding authorities and some control over service delivery.

In Ireland, boarding-out has been explored. Patients are placed with nonrelatives in private homes. The client and the state split the

costs. However, most of their elder home care is focused on formal and informal care, but needs regulation and a framework to govern key areas of access, financing, and quality.

Demographics in Japan suggests that by 2014, the increase in the older population will reach 32 million (25 percent of the total population), creating a tremendous market for long-term care design services. In Japan today, 16 percent of the population is 65 or older, but more than 50 percent of all health-care dollars are spent on these older Japanese.¹³ For this reason, the government already provides preferential interest rates on universally designed homes that prevent institutionalization. Since elders live longer lives with more disabilities and require more care, older Japanese are demanding residential long-term choices offering independence, personal growth, and support for activities, security, privacy, and dignity.

Sweden boasts world's largest proportion of citizens over 65 years of age and the largest proportion of people over 80 years of age. Many are in good health and lead active lives. Nearly 94 percent live in their own homes. According to the Swedish Institute, Sweden invests 2.8 percent of its gross domestic product providing public care services for the elderly.

Although about 90 percent of all elderly care is provided by the government in Sweden, the elderly are allowed to choose whether they want their home care or senior housing to be managed by the public or private sectors. The goal of the government care provision is to ensure that older people and those with disabilities are able to live independently. This system advocates for living at home for as long as possible. The support includes home meal delivery, help with cleaning and shopping, safety alarms, and a transportation service.¹⁴

Sweden and Denmark have moved many health services to residential environments. Sweden has been reducing nursing home beds by about 900 beds per year.¹⁵ Existing nursing homes are viewed as subacute facilities where only the most severely impaired patients belong.

In Europe, much of this care is delivered in sheltered-care houses, which are typically smaller than U.S. assisted living facilities. In Sweden, five to six people may each live in their own small apartment grouped around a large living area and kitchen. At a minimum, each apartment has a separate bedroom and small kitchen. Couples frequently have two bedrooms, which offer the flexibility to hire live-in help at a later date. Some units are equipped with passive systems that summon help if the toilet has not been flushed or if the refrigerator door has been left open. Motorized windows sense rain and close automatically. Toilets have built-in rinse and dry features. Sinks tip forward to ease hair-washing from a seated position. The Swedes have found that design intervention is less expensive than staff intervention and that care in the home is less expensive than institutionalization. Grants are provided for adapting homes to meet the needs of the elderly and persons with disabilities. If a grant is awarded, the government pays the entire cost of the renovation, equipment, and furnishings needed to make the home adaptable.

Denmark is considered the most advanced country in Europe in terms of social policies for older people. Services are typically brought to people in their independent living units until that becomes impossible. Then, every attempt is made to find long-term care within the immediate neighborhood of the individual. Housing complexes often offer intergenerational care, integrating children and seniors while still offering privacy. Considerable effort is made

to blend these facilities into the neighborhood. Commercial restaurants, rather than dining rooms, are located within the facility. Day care and therapies are offered to the public by the facility, encouraging community interaction.

In Denmark, disabled people have a *legal right* to continue living at home. Very extensive modifications to existing houses are paid for by the government. It is considered good economic housekeeping to empower a disabled person to

continue living at home. Legislation requires all ground-floor flats to be accessible. As general housing in Denmark has become accessible, the need for special housing for people with disabilities is reduced. Design demonstration centers are in place, allowing citizens to learn about their choices. These centers also help in the development of new equipment, providing consumer feedback to designers and manufacturers.

ENDNOTES

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1 ASSISTED LIVING

The future of assisted living is lifetime care in one location. It is not the continuing care concept where residents are moved from independent living to assisted living to skilled care units. The best of assisted living provides the independence and dignity of a home, individual assistance with daily activities, and physical medical care for life in the same apartment.

Traditionally, assisted living is defined as a housing model offering support for unscheduled needs,¹ including assistance with ADLs, personal care, and some health care. Skilled nursing is defined as 24-hour medical intervention. However, it is important to note that, in regard to health-care services, the lines are blurred; many residents view the trip to skilled nursing as the last stop, but often, as residents regain their health status, they are moved back to assisted living for rehabilitation.

Health care is now portable; many interventions can easily be brought to patients and their families with advancements in home health care. In addition, most assisted living complexes offer transportation to ambulatory care. Many have nurses on call, if not on the premises, 24 hours a day. Some complexes have two-tier call systems that let residents choose between minor assistance and emergency help. Prevention is a priority—nutrition, exercise,

social activities, security, and safety (see Checklist: Security on page 54) are part of an integrated program of services managed by the provider.

In the United States, a shift has occurred over the past 10 years, shaped by consumer demand. Assisted living has been the fastest-growing sector of housing for seniors. However, it is important to note that this industry is serving fewer and fewer low-income residents, often not accepting government financial support programs like Medicaid. Therefore, those with money have access to housing options driven by consumer demands, while those with limited resources have limited choices. Because of financial limitations, many older people who simply need assistance are residing in substandard skilled nursing facilities that are supported by government resources. Also, due to policies, either state mandated or provider driven, many residents are forced out of their assisted living situation when they begin to need more assistance, limiting the opportunity for aging in place.

This is not true in much of Europe, where a distinct separation is maintained between housing and health-care facilities. Rehabilitation, emergency assistance, and 24-hour skilled nursing are available at home, but fewer Europeans actually live in health-care facilities. The United States has the largest percentage of people living in nursing homes of all developed countries in the world.²

ASSISTED LIVING IN EUROPE

In 1996, the Humanitas Bergweg apartment for life project was completed in Rotterdam (see Figure 1–1).³ The Dutch concept was to create a housing and service system that supports older frail people in a normal apartment. What started out as the “Apartment for Life” philosophy of care has burgeoned into a multigenerational community accessible housing complex that provides apartments for 250 residents—rich and poor, healthy and sick, and young and old live in a noninstitutionalized setting. Though the average age is 80, the age range is 55–96; another twenty-five younger individuals with developmental disabilities live there.

They will not be moved along the continuum of care from independent living to assisted living to skilled nursing. Humanitas Bergweg residents can now live with their spouse of any age, even a spouse with Alzheimer’s disease. They can have their children stay overnight in the apartment, and develop friendships with their neighbors without fear of being moved out of the neighborhood into a health-care facility. This project has literally returned



Figure 1-1 Lifetime care without moving. *Courtesy of Stichting Humanitas Rotterdam.*

life to residents who were previously subsisting in semiprivate (which means almost public) rooms in nursing homes.

The complex consists of 195 lifetime apartments, each with two or three rooms averaging 750 square feet. The apartments are not only accessible to people in wheelchairs; they are accessible to people in hospital beds as well (see Figure 1–2). Even bedridden residents can be bathed on a gurney in the privacy of their own bathroom (see the Kohler Demonstration Project Expert Focus on page 108).

The apartments are built over an ambulatory health-care facility (see Figure 1–3) offering skilled nursing to one third of the residents, assistance to another third in the apartments while the remaining third receive no services and live independently. Instead of moving to a nursing home, nursing care is delivered by a home care provider. Many apartment residents, however, need therapy and rehabilitation, which is available within the complex or within the neighborhood.

Each apartment overlooks an atrium whose glass roof provides year-round protection from the elements. Atriums are appreciated by older people with concerns about safety and security (see Figure 1–4). Even though the Humanitas Bergweg atrium is located on the second floor, a stream runs through it. Sculpture, trees, and plants are all bathed in daylight, a

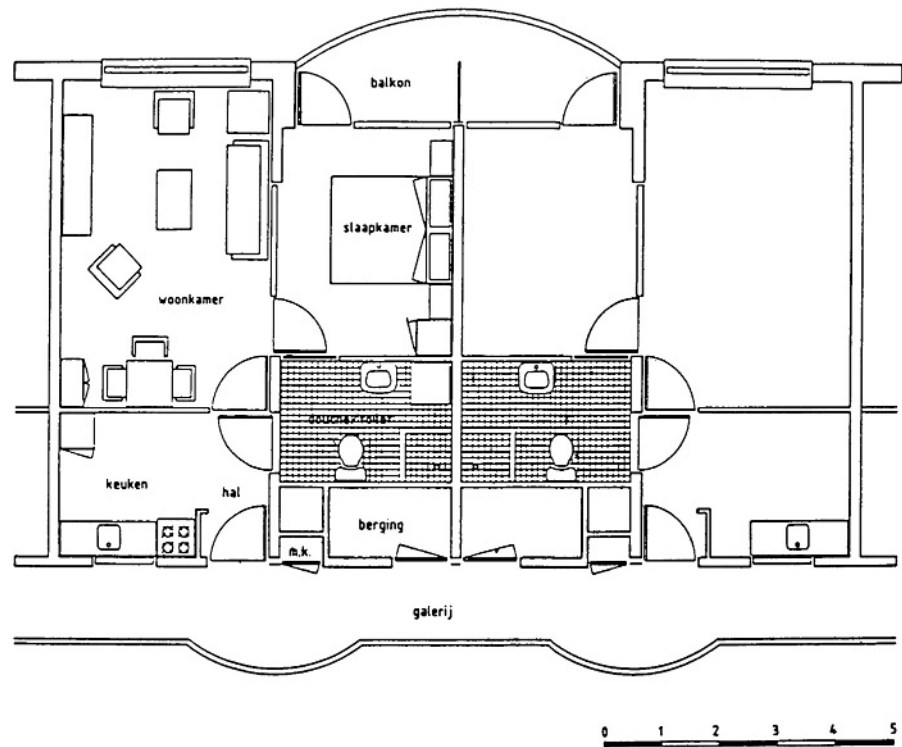


Figure 1-2 Gurney-accessible apartment to support aging in place.
Courtesy of Stichting Humanitas Rotterdam.



Figure 1-3 Geriatric rehabilitation in an apartment building.
Courtesy of Stichting Humanitas Rotterdam.



Figure 1-4 Atrium provides security and protection from the elements. *Courtesy of Filo Laken, Stichting Humanitas Rotterdam.*

major contribution to a healing environment. Surrounding the atrium is a 20,000-square-foot shopping mall that is not just for the elderly—the entire community uses the shops, restaurants, hairdressers, kiosks, and so on. Next to the elevator, an escalator from the street invites walk-in traffic and community interaction with the residents (see Figure 1-5).

In addition to serving 195 apartments, the ambulatory health-care facility provides day care for 20 community residents and is staffed with occupational therapists, physical therapists, a full-time general practitioner, a dentist, and a massage therapist. Its offices open to the street, encouraging community use. The entrance to the facility is also on the street level, well away from the apartment entrance. There is clear separation between housing and health-care facilities.

Humanitas Bergweg is a truly integrated complex offering shopping, dining, and health care to the entire community in a mode sensitive to the security and dignity of the older residents. This housing model is emerging in many countries in northern Europe. Increasingly, Europeans are not required to move out of their homes into a health-care facility. If a resident does not function well in an apartment, other housing choices are available (e.g., group homes for people with advanced stages of Alzheimer's; see



Figure 1-5 An escalator to attract visitors. *Courtesy of Stichting Humanitas Rotterdam.*

Chapter 2). But many older people can receive services in their own apartments for life, even if they lose ambulatory ability and are confined to bed.

Although the apartments are constructed over a geriatric rehabilitation clinic (see Chapter 5), the separation between the place in which one lives and the place in which one receives health care is well defined. If necessary, one can receive treatment all day in the clinic and still have the dignity of returning to one's own apartment at night. Residents are expected to perform at their highest level to save staff time and maximize independence. For example, therapy equipment is displayed in visible public areas to encourage residents to exercise without staff reminders. Residents are actually expected to exercise to maintain ability and elevate self-esteem.

The units are much larger than those in a typical nursing home, yet the costs are about 35 percent less. The management attributes that savings in part to the peripatetic approach to care giving that characterizes this philosophy. After all, the whole system is operating on only 90 full-time employees.

ASSISTED LIVING IN THE UNITED STATES

Much of U.S. assisted living design was built by former nursing home administrators and is still based on a nursing home model. This model is the result of the social programs of the 1960s and 1970s, when the federal government

became the principal payer for care of elderly residents in nursing homes. Government reimbursement drives nursing home design and staffing, dictating such details as square footage per patient. Reimbursement is dependent on government approval through the certificate of need (CON) process and state inspections. There is little change in revenue when these inspections determine that quality of care exceeds the level required by regulations, and every incentive exists to maintain minimal care. Design improvements are discouraged by lengthy waiver, conditional-use permit, and variance processes.

On the other hand, the best designers overcome the challenges and still manage to build innovative models. Theirs is the work that raises overall quality levels. Theirs is also the work that gets published and becomes the latest standards of good design. For example, when assisted living is combined with historic preservation, requirements can be modified to preserve the historic significance of the project (see Figure 1–6). One restoration was able to hide sprinkler heads in cornices and visual alarms under chair rails, retaining their function but eliminating the institutional appearance they convey.

Many licensure codes, however, would need to be changed to construct affordable Scandinavian lifetime models in the United States.⁴ Scandinavian fire codes for long-term care are less stringent than those in the United States, allowing fireplaces in skilled nursing homes, reduced separation requirements, and natural (flammable) materials. The Scandinavian Living Center is an assisted living community in the Northeast that has focused on environmental attributes that provide a high quality of life while providing the care and support that seniors require. While this facility does not have fireplaces, it does have large windows in each unit to provide natural light in an apartment living environment; and a design that encourages independence, community, and fitness (including walking, stretch and yoga classes, massage therapy, and physical therapy on site).

What are the program requirements of an assisted living model? In addition to transportation, the model must include optional assistance with the ADLs. These activities include housecleaning, daily bed making, linen service, personal assistance (e.g., bathing, dressing, and medication), meals, and health monitoring (e.g., pulse rate, blood pressure, and weight).⁵

Some of these services can be provided by family members, reducing costs as much as 40 percent and encouraging family participation with the resident.⁶ Residents should also be encouraged to help one another to bolster self-esteem, reduce dependence on staff, and reduce costs. A case manager must track volunteer involvement and ensure that all needs are being met.

This ten-story condominium complex is located in San Mateo, California. It offers 65 condominiums that can all be converted to assisted living.



Figure 1-6 Historic preservation in the assisted living setting. *Courtesy of John Bertram House, Assisted Living Residence.*



Figure 1-7 A comfortable library with natural materials creates a homelike public space. *Courtesy of Seccombe Design Associates, Inc. © Chas McGrath.*

This is one of the few complexes in the United States licensed for both independent living and assisted living in each residence. Amenities include hotel services; a concierge keeps treats on hand for the many pets. Design details include an electronically controlled entrance, a library (see Figure 1–7), and an enclosed swimming pool. A nice option is offering choices in dining: elegant restaurant-style dining (C-1), private dining rooms, and perhaps a chef’s bar for a quick meal (see Figure 1–8).

The Stratford plan includes a lifetime medical program, including an on-site physician for consistency of care (see Figure 1–9) and a full-time registered nurse. Transportation is provided to all medical and dental appointments, and medical insurance forms are processed by the staff. The wellness program includes health education (in the penthouse lecture room overlooking the bay), fitness classes, and nutritional consultation.

An alternate model for lifetime care is been offered on many college campuses—Cornell, Iowa State, Indiana University, University of Connecticut, Dartmouth, Duke, University of Washington, Stanford, Princeton, and Lehigh, to name a few. Assisted living apartments are provided on campus, offering all of the perks of college life with none of the course requirements. Residents can attend classes, parties, free concerts, and collegiate games.

Figure 1-8 A restaurant, not a congregate dining hall. *Courtesy of Seccombe Design Associates, Inc. © Chas McGrath.*



Figure 1-9 Exam room in a condominium complex. *Courtesy of Seccombe Design Associates, Inc. © Chas McGrath.*



Sophisticated medical care is often available on these campuses and there is a strong emphasis on rehabilitation. Although skilled nursing is not generally offered in the apartments, most schools have a fine record of getting residents out of nursing homes and back on their own.

PLANNING PUBLIC SPACES

The best of assisted living apartments provide environmental layers to allow residents to gradually enter social situations. A deck overlooking the entry permits residents to screen visitors without making a social commitment. The deck can also be used as a place for residents to smoke away from the entry. The first impression at many complexes is an entry littered with cigarette butts and a group of smokers as the official greeters.

Entry landscaping must be carefully planned with no place for an intruder to hide. Even in safe locations, older people may perceive danger lurking in a highly landscaped entry. Night lighting contributes to the perception of safety and empowers the many older people who have trouble with night vision.

Landscaping should offer distinctive layouts for each entry. Courtyards assist residents with orientation by spatially differentiating exterior landscaping. Parking lots should also be small and clearly differentiated (see Checklist: Security on page 54). To maintain a residential environment, delivery vehicles should not use the main entrance. They should deliver close to the staff kitchen, perhaps through a residential garage.

As in any apartment building, the public spaces of assisted living complexes should be homelike and inviting but not at the expense of clear spatial definition. Forty percent of assisted living residents have some degree of dementia, and they may become confused in unfamiliar spaces like large congregate dining halls.

Interior spaces should be small, intimate, and clearly defined. Interior social layers can be created by half walls, balconies, window seats, greenhouse enclosures, and atriums. Glassed-in porches can provide the dual benefit of a social layer as well as access to nature in a safe environment for socialization. Exterior views of nature keep residents alert to the weather and to seasonal changes (see Figures 1–10 and C-2).

An exterior swimming pool offers an opportunity to exercise, spend time outdoors, and socialize. Tables with umbrellas can define personal space in the pool area and create another social layer. A swimming pool also offers an excellent opportunity to invite the community into the complex for exercise classes or an afternoon of family fun.



Figure 1-10 Sitting on the porch provides access to fresh air, views of gardens, and activity in the neighborhood. *Courtesy of Susan Rodiek.*

EXPERT FOCUS

Design Features that Contribute to Homelike and Inviting Spaces

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According to the National Center for Assisted Living (NCAL),¹ more than 900,000 Americans currently live in assisted living communities. Three-quarters of residents are women, and the typical resident is 86 years old and needs assistance with approximately two activities of daily living. Although older women are the primary occupants of assisted living, family members are often the key decision makers when selecting a community. The most influential family members are daughters between the ages of 45 and 55.²

What physical features of assisted living communities are important to older adults and family members? Which characteristics contribute to homelike and inviting public spaces? I have found, through a series of photographic surveys with several hundred older adults and family members, that familiar housing cues, references to nature, scale, and accessibility are important in varying ways to these two distinct groups.³

In my studies, both older adults and family members responded favorably to symbols associated with the house, including porches, porticos, sloped roofs, gables, window shutters, fireplaces, and residential furniture as well as familiar spatial patterns and well-defined spaces that promoted understanding. Unfamiliar housing cues such as the porte-cochere, the windows of uniform shape and size, and the information desk with a large built-in counter often evoked images of hospitals and funeral homes. Direct references to nature through interior plants, natural light, and landscaping were desirable. Indirect references provided by window views and building materials such as wood and brick were also desired by both older adults and family members.

The two groups differed with respect to scale. Older adults tended to favor lower ceilings in public spaces and one-story building heights that appeared more manageable. They preferred changes in rooflines, setbacks, and materials that helped to reduce the overall massing of buildings. They responded favorably to smaller bookcases rather than wall units and preferred windows with panes to humanize interior spaces.

The two groups also differed with respect to the accessibility of spaces. Older adults experience the environment through sensory modalities that have been altered by aging. In particular, a decrease in visual acuity, an increase in sensitivity to glare, hearing decline, and reduced touch sensitivity may impact older people's ability to interpret the environment and respond appropriately. As a result, older adults desired features such as indirect lighting provided by clerestory windows and cove lighting, furniture and flooring with matte finishes, furniture with padded but firm seating, and adequate spacing between furniture that facilitated independence. In contrast, these features were not salient in family members' perceptions.

When input from potential consumers—older adults and family members—is taken into account, designers may be more likely to create humane assisted living communities that support expectations, understanding, and effective functioning. And when consumers are satisfied, well-being and market appeal may be enhanced.

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3. J. P. Marsden, *Humanistic Design of Assisted Living* (Baltimore, MD: Johns Hopkins University Press, 2005).

Water aerobics (followed by a sauna or spa) can provide significant pain relief. Swimming pools must be planned for users in wheelchairs as well as those with reduced hearing and vision (see Chapter 8). An interior pool may be a good place to increase sensory stimulation by adding live butterflies and the relaxing sound of falling water. If the pool is located in the basement, provide access to daylight and extra attention to acoustics. The concrete surfaces may reflect sound, making therapy and instruction difficult. Consider an instruction pit, a sunken area next to the pool that keeps the instructor dry and at the same level as the swimmers. Instruction and treatment areas should be acoustically isolated from the rest of the complex to prevent sound transition.

Access to natural elements may also be provided by large windows that open onto protected interior gardens and invite exploration. Double-loaded corridors (with rooms off both sides) offer few opportunities for window placement. A corridor that circles an atrium or patio tends to have shorter horizontal stretches and offer more articulation. When this design is not

possible, the corridor can be deconstructed with jogs or curves. Corridors can be planned to encourage chance encounters and excuses to meet people. Resting places should be provided and supportive handrails visually integrated (see Checklist: Handrails on page 260).

Details define a residential environment. Seating breaks up long walks; kiosks offer snacks and drinks. Conversely, the design formula for an institutional environment is uniformity and lack of detail. Shiny beige vinyl composition floor tile and unfamiliar spaces like dayrooms are institutional clichés (see Checklist: Flooring on page 203).

Rooms should be planned with clarity of purpose. Keep spaces understandable, with public spaces very public and private spaces very private. Residents do not understand a living room with 50 chairs in it. Spaces and finishes should anticipate behavior and physical limitations, particularly dementia and incontinence.

Most assisted living residents experience some degree of memory loss. Familiar details like a fireplace, a case filled with books, and a china cabinet can trigger long-term memory and serve as important way-finding cues (see Figure 1-11) (see checklists: Environmental Way-Finding and Orientation Cues on page 253). Fragrances like baking bread and morning coffee are also important cues. Music can be used to bring back long-term memories and cue the start of daily events, maintaining a sense of order.

Public space in assisted living can and should retain familiar, home-like qualities. Residents can be offered supervised options, like participating in laundry and cooking. A vegetable garden, aviary, greenhouse, aquarium, and liberal pet policy also allow the residents to express personal interests.



Figure 1-11 Comfortable furnishings and a warm fireplace have a homelike appeal. *Courtesy of studioSIX5.*

Secure displays of personal collections offer important way-finding and orientation cues. Residents feel more in control when designers humanize interiors with such elements as bay windows, mullions, balconies, and carpeting (see Checklist: Carpeting on page 21). Human scale should be maintained, especially in areas frequented by residents. Entries, porches, and transition spaces may include windows with small panes and doors with details on a traditional residential scale.

CHECKLIST

Carpeting

- Light-colored carpeting increases light quantity throughout the space without increasing glare (see Figure C-3).
- Hard-surfaced floors are not safer than carpet for controlling fungal or bacterial growth in health-care environments.¹
- Hard-surfaced floors may hinder walking efficiency and confidence. In a study of 58 elderly hospital patients, carpeting significantly improved mean gait speed, step length, and walking confidence.²
- Carpet used with wheelchairs, carts, and gurneys cannot exceed ½-inch pile height, and a ¼-inch height offers less resistance to rolling traffic.
- High-cut pile may pull a wheelchair, gurney, cart, or stroller in the direction of the nap. Use an uncut or tip sheer in a high-density pile for an easy traverse.
- Carpeting with an antimicrobial system prevents microbial growth and resulting odors.
- For people with dust allergies, hard-surfaced flooring is a better choice than carpeting, which can harbor dust and dust mites.
- People with incontinence may associate cold, hard floors with going to the bathroom and thus will appreciate carpet.
- Carpet reduces the incidence of falls and cushions falls that do occur. The carpet should have a pile height of ¼–½ inch; the pile should be of a high density. A carpet surface that is too soft is easy to sink into and may cause loss of balance. Large loops can catch on braces, canes, and walkers.
- For people with hearing difficulties, reduce electrical interference with hearing aids by installing static-resistant carpeting.
- For people with incontinence, seal concrete slabs with an acrylic polymer before installing carpeting. If the concrete flooring is hydrophilic, it absorbs liquids and their odors as it expands and contracts.

Continued

CHECKLIST

Carpeting (continued)

- Area rugs should be permanently installed to prevent tripping. The small wheels of wheelchairs, gurneys, carts, and strollers may cause loose area rugs to gather in front of the user. People in power wheelchairs may also be immobilized, and rugs may become tangled with the mechanism.
- Borders can be used to blend carpet colors from room to room, but keep the contrast to a minimum so that a border is not mistaken for a step.
- It is often difficult to spot a slight elevation in floor level. Single steps, thresholds, carpet tack strips (especially across corridors), and the edges of area rugs all cause tripping. Use a bevel when changing from one floor surface to another if the change is between $\frac{1}{4}$ and $\frac{1}{2}$ inch. Use a small ramp if the change exceeds $\frac{1}{2}$ inch (see Checklist: Handrails on page 260).
- Metal carpet strips between rooms may pose a tripping hazard. Sew carpets together at doorways or use graduated transition strips.
- For the easiest wheelchair ride over carpet and for a stable surface offering sure footing, eliminate padding in the carpet installation. A glue-down installation also prevents rippling caused by wheelchair or gurney use.

1. Center for Disease Control and Prevention, *Guidelines for Environmental Infection Control in Health-Care Facilities* (Atlanta: U.S. Department of Health and Human Services CDC, 2003).
2. M. Wilmott, "The Effect of a Vinyl Floor Surface and Carpeted Floor Surface upon Walking in Elderly Hospital In-Patients," *Age and Aging* 15 (1986): 119–120.

Entries, reception lobbies, and elevators require increased lighting levels, up to 100 footcandles for close work like reading instructions or signs⁷ (see Checklist: Universal Lighting on page 90). Redundant cuing should also be provided in the elevator, and an emergency elevator phone should be connected directly to the building manager and receptionist (see Checklist: Elevators on page 140). This phone cannot replace the elevator alarm system required by the Americans with Disabilities Act (ADA).

Lighting is also used to reinforce the change from public to private space. Increased lighting levels at apartment entrances offer control, security, and clarity. Differences in detail, materials, and size can accentuate the transition, providing a unique apartment entrance as part of the way-finding plan. The entrance can also serve as an important place to people-watch from a wheelchair or to charge a power wheelchair. For this purpose, plan a special outlet and ventilation from the odors caused by recharging. For ambulatory residents, provide a place to sit down to remove boots and overshoes before entering the apartment.

EXPERT FOCUS**Senior Living Sustainability Guide (SLSG)**

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The Senior Living Sustainability Guide will be available online and will consist of the following four sections or modules that may be utilized in tandem to develop sustainable senior living communities.

Resident Quality of Life

Perception of life quality changes as physical and mental abilities decline. Many seniors measure quality by how close the lifestyle is to that of active elders living in their own home. Therefore, the primary goal of a senior community will be to provide the opportunity to continue basic activities of daily living and special interest activities. As resident support and care needs increase, the challenge is to compensate for the physical and mental losses as much as possible through environmental supports.

The guide shall utilize indicators of quality of life based upon resident-centered care. For example, privacy is an important tenet of resident quality of life. The following would be indicators of privacy:

- Operational policy in place that includes staff knocking on a resident's door prior to entering their private space. This includes in-service training for the staff.
- Private rooms that include personal controls at bedside for lighting and window blind control.
- Organizational commitment to provide private resident rooms, but with the flexibility to accommodate couples and situations that may benefit from the sharing of a room (due to diagnosis or level of dementia).

Organizational Values and Vision

Sustainability of the organizational values and vision is essential for developing and maintaining organizational momentum and effectiveness. Accomplishing this requires that the governance body/owners of the community define: (1) the core values that guide all governance and operational decisions and actions, and (2) a vision of the desired state of being of the persons served after their interaction with the organization. Progress toward the vision is the primary measure of organizational success. While the means to achieve the vision will change over time as the external environment changes, the means used will always uphold the values and the outcome of a high quality of life for residents. The Organizational Values and Vision process holds true for both new development as well as for repositioning projects.

Operations

Achieving sustainable operations is dependent upon selecting, developing, and retaining the appropriate staff, including top leadership. Having a focused, innovative, efficient, effective, and consistent organization is dependent on having the right organizational culture. Since the CEO or executive director is the primary determinate of the culture of an organization, and since the values of an organization are expressed daily through the culture, the selection by the governing body of this leadership position requires the individual to live the values to maintain operational sustainability.

Continued

EXPERT FOCUS**Senior Living Sustainability Guide (SLSG) *(continued)***

The establishment of a functional program identifies each staff and resident area, including the activities and services that will take place in all locations. This information includes not only how a space shall function and operate, but also addresses equipment and storage needs, appropriate access by residents based upon the level of care, integration of the outside and the interior including access, and the need for certain spaces to relate to one another. Each function should be reviewed completely, including personal care services, food preparation and serving, laundry services, medication distribution, housekeeping and maintenance processes, communication services, and all other planned processes. It is the responsibility of the CEO or executive director to achieve sustainable operations and continuity of the functional program by providing the resources and training for all staff.

Physical Setting

The physical space program and adjacencies have to be based upon the functional program supporting resident quality of life and operations. This integration provides a setting for resident-centered care. A sustainable building design is flexible, having the potential for adaption and remodeling to meet changing needs. The building also supports future developing technologies, and allows for evolving care models. To reduce the environmental footprint of a building, consideration must be given to energy and water consumption. Recycling and reuse of materials and resources must also be considered together with the safe handling of chemicals and use of products with low volatile organic compounds. Lighting and acoustics also play a role.

All of the building design decisions must be made in a manner that does not compromise the other dimensions of sustainability—resident quality of life, organizational values and vision, and operations.

Conclusion

The Senior Living Sustainability Guide is the result of passionate individuals who desire to sustain the ability of elders to have a high quality of life regardless of the changes that the aging process inherently brings, and to do it in a way that sustains our world for future generations.

A NOTE ON APARTMENTS

Apartments are private; facilities are not. When people are shuffled from level to level, possessions must be eliminated and physical territory is reduced. The value of privacy and independence increases dramatically.

The apartment represents a place to maintain independence when, through aging, all forces seem to lead to less control. An individual's home allows that person to stay in touch with *the person they were in the past*. It provides a place to accumulate memories.

As we age, each change can represent a loss of territory and possessions. Symbols of life like a flower box, a mailbox, a doorbell, a clothesline, and holiday displays become increasingly important. Residents need to remain

connected with others, but through windows, doorways, and porches that permit the choice of privacy.

Chapter 3 is filled with universal design detail that should be integrated into apartments. As a closing thought to this chapter, please consider that social spaces and bedroom spaces are culturally incompatible. At a minimum, apartments should offer separation between sleeping areas and living areas.

ENDNOTES

1. M. Kalymun, "Toward a Definition of Assisted Living," in *Optimizing Housing for the Elderly: Homes, not Housing* (New York: Hayworth Press, 1990), 97–132.
2. House of Representatives Select Committee on Aging, *Housing for the Frail Elderly: Hearing, May 4 and July 26, 1989* (Washington, DC: GPO, 1989): SD cat. no. Y 4Ag 4/2:H 81/26.
3. V. Regnier, *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail* (New York: John Wiley & Sons, 2002).
4. V. Regnier and D. Hoglund, "Expanded Housing Choices for Older People: Building Codes Impact on the Environment of Older People," paper delivered at the American Association of Retired Persons White House Conference on Aging, Mini-Conference, August 1995, Tab 700, 69.
5. American Institute of Architects, *Guidelines for Design and Construction of Health Care Facilities* (Washington, DC: American Institute of Architects, 2006).
6. V. Regnier, *Assisted Living Housing for the Elderly* (New York: John Wiley & Sons, 1997).
7. E. Brawley, *Design Innovations for Aging and Alzheimer's: Creating Caring Environments*, (New Jersey: John Wiley and Sons, 2006).

