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## **Household Models for Nursing Home Environments**

There will always be a need for long term, medically supervised, personal care settings. Current financing and care models dictate that these settings group individuals together for efficiency. At the same time, studies point to the positive effects resulting from social interaction. The form these settings take, depends not only upon the vision and resources that sponsoring organizations offer, but also to the approach regulatory agencies use to protect public health, safety and welfare. This paper examines concepts that influence the design of long-term care settings, demonstrates several newer household typologies, and suggests regulatory modifications that would enable further development of this new generation of nursing home.

### **Form Follows Regulation**

For many years, the program brief for the design of nursing homes was based upon the regulatory model of an institutional based setting. This began with the publication of the original *General Standards* in 1947 for the implementation of the Hill-Burton requirements for health care facilities. This later became the *Minimum Requirements of Construction and Equipment for Medical Facilities* that set down the design requirements for nursing homes participating in Medicare and Medicaid programs (Guidelines 1996 - 1997).

The Hill-Burton requirements were a set of prescriptive regulations defining minimum standards of design and construction. Prescriptive requirements included elements such as: maximum number of residents per sleeping room; minimum square feet per patient within a sleeping room; minimum square feet of dining and activity space per patient; minimum quantities of toilet and bathing fixtures per patient; maximum travel distance from a nursing station to each patient room door; and requirements for visualization of the corridor from the nursing station.

Prescriptive requirements led to a situation where architects and designers used the regulations as the basis for all planning and design decisions. Due to cost constraints, minimum requirements quickly became maximum allowable quantities and sizes of facilities, and in some jurisdictions, these maximums were mandated. Such mandates not to exceed particular size requirements grew from a fear that the state government may need to take over and operate poorly performing facilities. It only makes common sense that a facility with more square feet per patient is more costly to operate than a smaller facility.

Over time, nursing homes began to look alike, with large nursing stations, situated to provide direct view, down a series of double-loaded corridors, radiating from a central observation point. This unintended similarity of outcomes is what I refer to as *Form Follows Regulation* a situation where regulations seem to dictate the ultimate form of the physical environment.

### Hierarchy of Space

The field of Environmental Psychology is based upon the concept that the physical environment has a significant impact in shaping the actions of individuals and groups. The layout and composition of spaces can either inhibit or encourage social interaction among individuals. Similar to the way a line of chairs set in rows at a bus depot discourage interaction, double loaded corridors, lined with adjacent bedrooms, allow little opportunity to socialize. This type of spatial organization is referred to as *sociofugal*, space that separates people. To promote interaction one should create *sociopetal* space, space that brings people together in groupings that face one another (Osmund 1957).

Another important concept that must be considered in the arrangement of space is what I refer to as the *Hierarchy of Space*. This is a spatial concept that refers to the progression of space in terms of access and activity. The progression is often defined as four different zones: *Private; Semi-private; Semi-public; and Public* (Howell 1980) (Figure 1). Each of these zones moves progressively from the individual control and safety of one's private space to increased opportunity for interaction with others in the public realm. All zones are important and are required to live life completely.

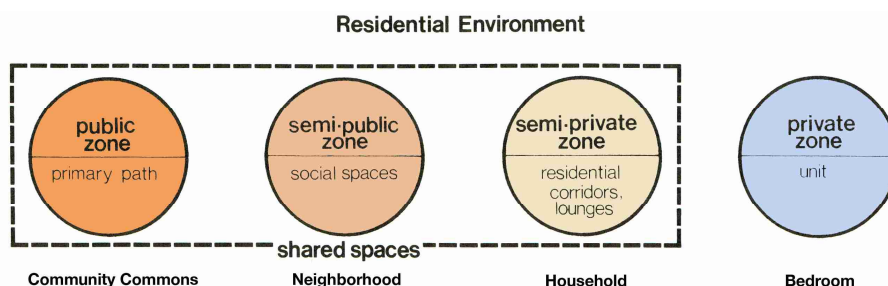


Figure 1

This progression of the physical environment is of particular importance to older people who are increasingly vulnerable to abrupt changes in environmental stimuli. They may no longer possess the resiliency to moderate this environmental press, or impact that the physical environment can impose. Unfortunately, within the typical nursing home the hierarchy of space is truncated into only two zones, private and semi-public. There is little opportunity for life that is not either confined to the private zone of one's bedroom (if one considers a shared bedroom private), or as a lonely bystander within the semi-public zone of large, undifferentiated dining rooms, dayrooms and corridors.

An early concept for improving the hierarchy of space within nursing homes was proposed in *Designing the Open Nursing Home* (Koncelik 1976) (Figure 2). This design took the typical lounge or dayroom of the institutional model, often found at the end of the corridor, divided it into smaller areas and relocated the space as a "front porch" between the private resident bedroom and the public corridor space. These transitional semi-public/semi-private spaces provided a zone referred to as the "corridor neighborhood" offering opportunities for personalization and a variety of visual stimuli, reducing the typical repetition of corridors.

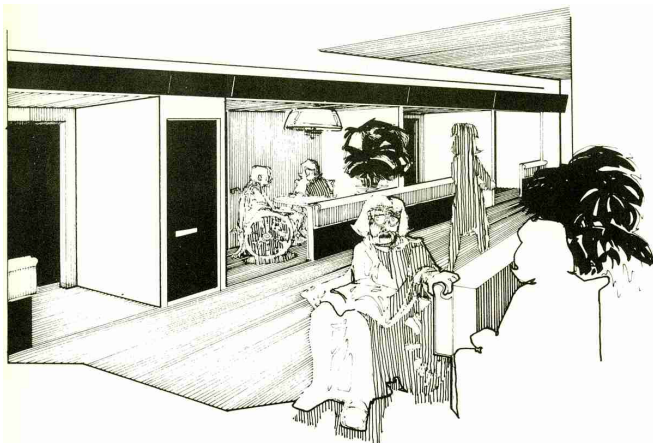
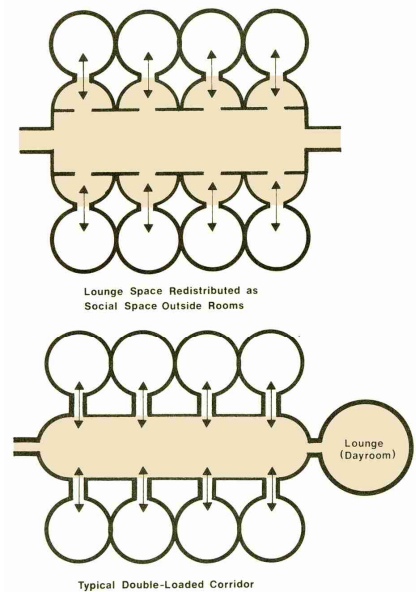


Figure 2

Part IV: Design



*Designing the Open Nursing Home*  
Joseph A. Koncelik, 1976

## **Quality of Life**

Until the Omnibus Reconciliation Act (OBRA) of 1987 little progress was made in the advancement of designs for nursing home environments beyond the traditional hospital -based institution. Even today, radial wings of double -loaded corridors with a majority of side-by-side semi-private bedrooms are still being constructed. But with the advent of OBRA 1987, nursing home operators were required to consider resident rights, autonomy, choice, control and dignity. Many forward -thinking operators saw this also as a mandate to significantly change the institutional design model of the physical environment.

Enhancing *Quality of Life* for residents has become a requirement. Yet little research or guidance exists to help facility operators and designers understand what it means to provide a life of quality.

Some organizations have conducted resident, family and staff *satisfaction surveys* to help understand how they are performing in the eyes of their constituents. Though helpful to some extent, these surveys provide little new information with regard to the physical environment. Regulators, architects and designers are not the only groups that are unable to break away from the institutional model that has been the standard for so many years. Residents, families and staff can only know the types of nursing home environments they have experienced.

The CMS State Operations Manual speaks in detail to many of the psycho-social aspects related to *Quality of Life* such as Dignity (F241), Self-Determination and Participation (F242), Participation in Activities (F245) and Activities (F248). But when it comes to direction with regard to the physical Environment (F252), it offers only that "The facility must provide a safe, clean, comfortable and homelike environment." And goes further to indicate that the environment must be "sanitary and orderly" (F253), provide "private closet space" (F255), "adequate and comfortable lighting" (F256), comfortable and safe temperature levels" (F257) and finally "comfortable sound levels" (F258). Only the last five requirements have any direct relationship to the design of the physical environment and provide very little

guidance indeed. Yet it is understandable that such requirements be performance-based rather than prescriptive in nature. It is extremely difficult to define what is, or is not "homelike," or how one might actually create "home" within institutional settings.

The American Institute of Architects (AIA) Guidelines for the Design of Healthcare Facilities is a consensus-based standard that provides much greater detail in its design guidance. Developed as both a regulatory document for adoption by legislative authorities, and as a guide to best practices, the document provides both minimum standards and educational guidance. Through the use of appendix material that sits adjacent to the regulatory language, designers and regulators are able to directly compare minimum requirements with newer design concepts. The appendices often serve as an introduction for new material that, in subsequent editions of the document, is adopted as requirements. The AIA Guidelines are a building design guide that works to avoid definition of operational requirements.

### **To Live in Fullness**

Wikipedia defines *Quality of Life* as "the degree of well-being felt by an individual or group of people" ([en.wikipedia.org/wiki/Quality\\_of\\_life](http://en.wikipedia.org/wiki/Quality_of_life)). Though not tangible or measurable, quality of life may be thought of as being comprised of two components: the physical and the psychological. Physical definitions of well-being would include ones level of health and safety. These are the aspects that have traditionally been heavily regulated within the long-term care environment, often to the detriment of psychological well-being.

It is the psychological aspects of well-being that offer the greatest potential to inform the way that physical environments for long-term care are conceived and constructed. Studies investigating the psychological concept of *Flow* provide much information.

Flow describes a state of being where one is completely immersed in an activity to the extent that one loses track of time. It is often associated with sporting activities where the concentration and effort required are closely matched to the challenge. In

sports it may be known as being in the groove. In religious settings, as a state of ecstasy.

Flow is the experience of "being in harmony with what we *Wish, Think, and Feel*" (Csikszentmihalyi 1997) being at one with the moment, so much so, that we lose ourselves to the task at hand as well as the sense of time. We have all heard the saying: "Time flies when you're having fun." The satisfaction that results from Flow experiences provides a true measure of the Quality of Life.

What is most helpful are studies that looked at the Flow potential of everyday activities (Csikszentmihalyi 1997). In these studies, people were asked to document their activities, whether alone or in groups, and their feelings about the activities. Unlike many studies that rely upon the memories of individuals entering their daily activities into a diary at the end of the day these studies required extemporaneous documentation at random intervals throughout the day. This methodology provides remarkable insight into the activities, feelings and participants involved in everyday living.

Within the studies, daily activities are broken into three categories that each occupy approximately one third of our waking hours. These activities include *Productive Activities, Maintenance Activities, and Leisure Activities*. The following chart indicating how people experience the various categories of activities and provides knowledge as to how we feel about what we do on a day-to-day basis (Figure 3).

## The Quality of Experience in Everyday Activities

Based on daytime activities reported by representative adults and teenagers in recent U.S. studies, the typical quality of experience in various activities is indicated as follows:

- negative; - very negative; • average or neutral; + positive; ++ very positive

Productive Activities	Happiness	Motivation	Concentration	Flow
Working at work or studying		-	-	++ +
Maintenance Activities				
Housework	-	-	•	-
Eating	++	++	-	•
Grooming	•	•	•	•
Driving, transportation	•	•	+	+
Leisure Activities				
Media (TV and reading)	•	++	-	-
Hobbies, sports, movies	+	++	+	++
Talking, socializing, sex		++	++	• +
Idling, resting	•	+	-	-

Sources: Csikszentmihalyi and Csikszentmihalyi 1988; Csikszentmihalyi and Graef 1980; Csikszentmihalyi and LeFevre 1989; Csikszentmihalyi, Rathunde, and Whalen 1993; Kubey and Csikszentmihalyi 1990; and Larson and Richards 1994.

Figure 3  
(Csikszentmihalyi 1997)

From this analysis it was found that those daily activities that produce the greatest potential to generate an experience of Flow include: Working, Studying, Driving, Hobbies, Sports, Movies, Talking, Socializing, and Sex.

Life is *What we do, How we feel about it, and Who we do it with* (Csikszentmihalyi 1997). The chart above tracks the first two elements, but it is the third, with *whom* we participate with in these activities, that adds a dimension to further enhance the experience.

Though a solitary engaged mind and body can provide much satisfaction, Csikszentmihalyi finds that "we depend upon the company of others" to live a life of fullness. "Over and over again, findings suggest that people get depressed when they are alone and they revive when they rejoin the company of others." He goes on to say, "The importance of friendships on well-being is difficult to overestimate. The quality of life improves immensely when there is at least one other person willing to listen to our troubles and support us emotionally."

Much of what the study found is that, "a typical day is full of anxiety and boredom. Flow experiences provide the flashes of intense living against this dull background." This points to the notion that in order to improve quality of life, one must engineer one's daily life to maximize participation in high Flow potential activities. Or as care providers, we must provide the opportunities to participate in activities that are engaging and challenging within a setting that enables the development of relationships.

At the Walden School in Vermont, students follow the philosophy of Henry David Thoreau by continually asking themselves three questions: *What is my relationship to myself? What is my relationship to culture? What is my relationship to the natural world?* (waldenschoolvt.org) In a similar fashion, it is helpful in the design of long-term care environments within a *culture change milieu* to think in terms of relationships. Focusing solely on the person or resident, as in *resident-centered care* or *person-directed care*, limits our thinking. Quality of life is enhanced when we consider the totality of experience within *Relationship-Enabling Environments*.

### **The Nursing Home - As Institution**

Clearly, the traditional institutional model of the nursing home falls far short of providing an environment that enables a fulfilling quality of life. The physical environment of institutions are sociofugal in nature, lacking in the appropriate hierarchy of spaces and provide little to enhance quality of life in resident' relationships with themselves, the community, or nature. Early concepts toward improving the physical environment provided only modest steps forward. Regulatory hurdles including health care design guidelines, building codes, life safety codes, food safety regulations, and a plethora of overlapping state and local health and safety requirements are all focused upon maintaining the institutional model of nursing home construction.

This institutional bias proved a difficult obstacle to overcome. As the image of nursing homes became less desirable to residents and families, alternatives such as assisted living began to appear in the marketplace. These alternatives provide an attractive image to residents and families, in many cases advertising themselves as "nursing home alternatives" through the provision of home health



care and visiting nursing services. Conformance to less restrictive residential codes and regulations help to achieve the desired "homelike" feel by allowing narrower corridors, elimination of the central nurse station and creation of smaller more intimate settings. Many in the long-term care industry predicted the end of nursing homes.

At the same time, many operators and designers were embarking on an alternative approach, not to supplant, but to reform the vision of the nursing home. Designs appeared with high proportions of private rooms, and shared rooms providing enhanced environments where each resident received separate sleeping areas with *each their own window* and furnishings, sharing only the room entry and toilet facilities. Corridors were shortened, nursing stations became less pronounced within nursing units of 36 -45 residents as opposed to the traditional 60 beds. Smaller decentralized clusters or pods that provided small-scale social settings closer to resident rooms were created. Staff support areas, including small work desks were also decentralized to increase staff efficiency by locating direct-care staff closer to resident bedrooms.

Most of these newer cluster concepts, however, are still corridor-based schemes with inconsistent or incorrect hierarchies of space where semi-public corridors pass directly outside of private bedrooms with little or no transition zone. Still, the institutional bias prevails due to requirements that all rooms open onto corridors that are physically separated from spaces as protection from smoke and fire, and that allow direct visual supervision of staff on a 24-hour basis. These requirements and many others conspire against the creation of a true home for residents.

### **The Household - A Relationship-Enabling Environment**

The Household model can be described as a living arrangement where all activities of daily living occur within a small-scaled environment, reminiscent of a large family home. This type of living arrangement has been used for many years as group home settings for developmentally disabled populations. The first use of the term *household* in a skilled nursing home setting described Evergreen Manor in Oshkosh, Wisconsin as "two neighborhoods with dining and bathing facilities shared by three "households" of six

private rooms which in turn share family rooms and kitchenettes” (Architectural Record, April 1988).

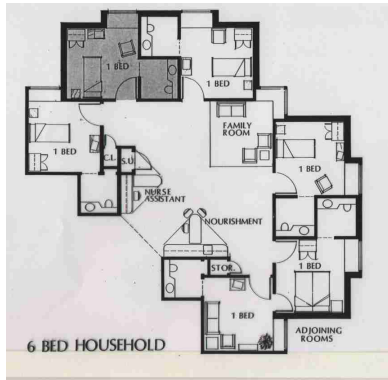
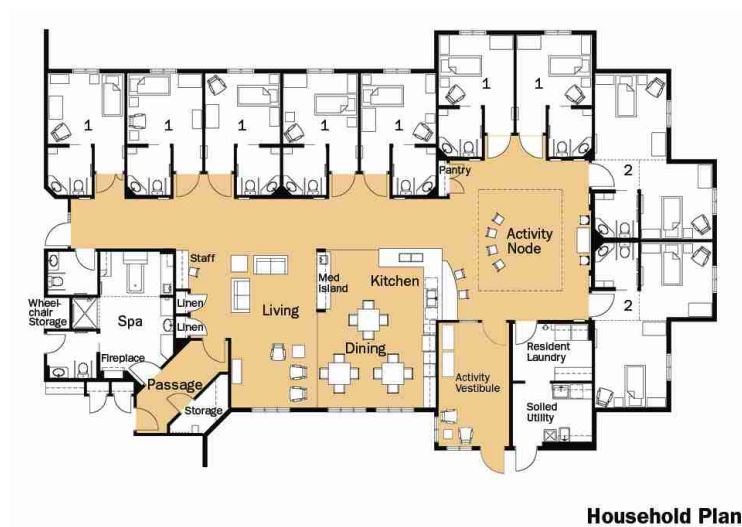


Figure 4

(Gaius G. Nelson @ KKE, 1987)

The initial concept (Figure 4), designed by this author in 1987, was developed ten years later into the fully formed household model by taking the crucial step of including the dining room within its nine resident household environment as a country kitchen. Opened in 1997, the fully operational Creekview at Evergreen Retirement Community is described as “a creative effort to rethink the nature of skilled care organizationally as well as architecturally” (DESIGN '98, 1998). Subsequent refinement of the household/neighborhood model resulted in the 2005 addition at Evergreen Retirement Community of *Creekview South* utilizing households of eleven residents each (Figure 5).



Household Plan

Figure 5

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The household model provides an environment that is immediately understandable to residents and visitors as a setting that has been a natural part of everyday life. Individuals intrinsically know how to act within a household. All activities of daily living occur within closely related *private* or *semi-private* zones that are discrete from other portions of the facility.

In addition to private or shared resident sleeping rooms with their own bathroom with toilet (and sometimes shower), households typically contain a living room, dining room, kitchen, and common bathing facilities. Often an additional, flexible activity space is included for use as a quiet room or small conference/work space. Open access to a secure backyard directly available to residents, enables a continuing relationship to the natural environment. Support areas for staff include a workspace used for storage of medicine and supplies as well as necessary paperwork, a soiled utility room, storage of clean and soiled items and equipment for laundering personal clothing.

The small scale of the household, with its open floor plan, virtually eliminates corridors and allows orientation and easy access for residents to all daily activities.



Living Room at Creekview

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Dining Room at Creekview

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Backyard at Creekview

The households at Creekview South are each part of a larger nursing unit known as a *Neighborhood*. Four households of eleven residents each are connected together through a *Neighborhood Center*. This organization (Figure 6) provides clearly defined geographic zones of responsibility for *resident assistants* within each household and the *team manager* for the entire neighborhood. Support is provided to each neighborhood and household from the adjoining CCRC campus through central services including procurement, housekeeping, commercial laundry (not resident clothing), and food service that provides prepared bulk food for individual plating from steam wells at each country kitchen.

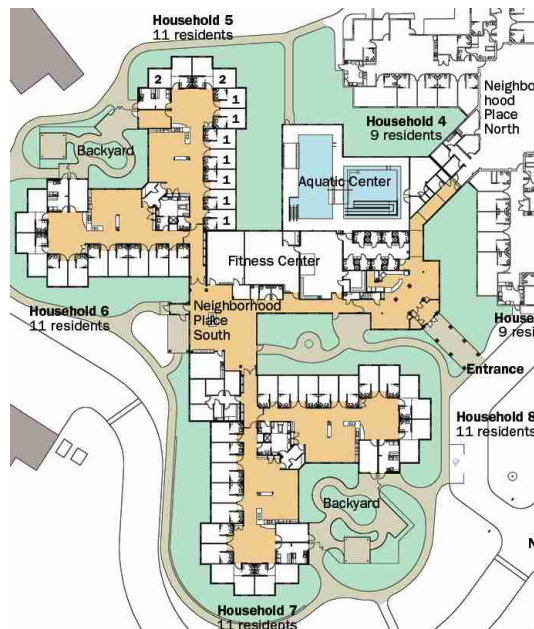


Figure 6

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The Green House<sup>®</sup> and Small House models of the household offer a complete break with the institutional nature of traditional nursing homes. "Intended to be a self-contained home for a group of 7-10 elders...a Green House<sup>®</sup> blends architecturally with other homes in its neighborhood" (The Gerontologist, Vol. 46, No. 4, pg. 538). It is envisioned that eventually these types of small, self-contained facilities could be developed as parts of typical residential neighborhoods with one or more "houses" integrated into the community.

The Green House<sup>®</sup> concept was developed by Dr. Bill Thomas. He states: "We wanted there to be a heart, a center, a focus of the house. So you know, what you have in the hearth is sort of food on one end, fire on the other, and a place to share convivium or the pleasure of a good meal sort of in the middle." He continues "We've always insisted in the Green House<sup>®</sup> that there be one big table, because that's how - that makes a meal into a community experience." (PBS Lehrer NewsHour, 01/23/08).

Similar in organization to the Creekview households, ten private resident bedrooms surround a large semi-private living space called "The Hearth" which includes a fireplace, living room, dining table, and open kitchen. Residents are encouraged to participate in household activities including meal planning and preparation, clean up and other activities. As a self-contained house, all resident and staff support areas are provided (Figure 7).

Personal care services are provided by specially trained staff dedicated to each house, while nursing services are provided by visiting nurses who are responsible for multiple houses.

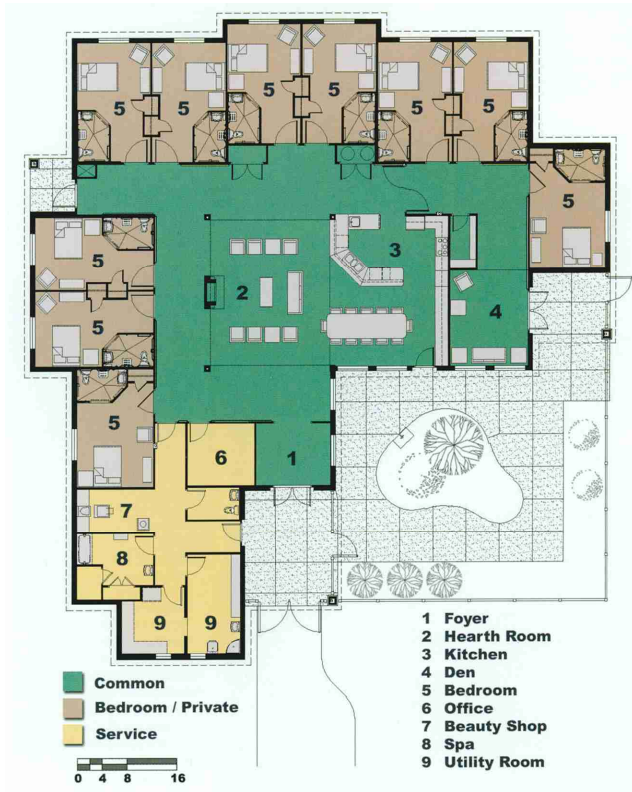


Figure 7

(DESIGN 2004)

Although the Green House<sup>®</sup> model envisions stand alone, self - sufficient homes, in practice, the first Green Houses<sup>®</sup> in Tupelo, Mississippi rely upon the support of the adjacent traditional nursing home for services such as housekeeping, central supplies and food purchasing, including some of the food preparation already accomplished (The Gerontologist, Vol. 46, No. 4, pg. 538).



Green House® Hearth Room looking toward kitchen  
(DESIGN 2004)



Green House® Hearth  
(DESIGN 2004)

While Creekview and the Green House<sup>®</sup> demonstrate a household plan layout where private resident bedrooms open directly toward the semi-private living spaces, other organizational approaches are also in use. Household organizations that locate resident bedrooms along corridors used only for accessing the bedrooms can provide an environment more closely related to a single family home, where one typically finds bedrooms separated down a short hallway from living, dining and kitchen areas. This concept was used at Meadowlark Hills and can be seen in the Chapman Shalom Home East nursing homes design currently under construction in Saint Paul, MN (Figure 8).



Household Plan

(Figure 8)

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Within this alternative organization of the environment, the corridor serves as an additional transition zone between the semi-private living areas and the private bedrooms. It is important when using this organizational technique that entrance to the household from semi-public areas occurs first into the semi-private social areas of the household. As in our homes, the front door does not enter into the bedroom hallway.

### Household Size

The scale of the environment is one of the most significant aspects to determine whether it is perceived as institutional or homelike in nature. In the case of the household model there are three major factors that influence the size and scale of the environment: the number of residents that make up the household grouping, the physical size of the environment, and the staff ratios necessary to provide the desired levels of care.

Recently constructed households tend to consist of between eight and twelve residents. This size of social grouping appears to be small enough to eliminate the potential disruption caused by excessive numbers of social interactions associated with larger group size, while also providing the desired critical mass needed



to foster personal relationships. " In any group we tend to see one-third of residents who participate in all offered activities, one-third who almost never participate and one-third who may or may not join in" (Powell 1998) (bibliography -personal discussion during project meetings while designing PGC replacement facility). Using this observation, with a household size of 8 -12, between three and eight residents will be available as part of the social environment. This size of social group also provides enough diversity to assure some level of common interest within the group. This is important as it is highly unlikely that all residents of what are often random groupings of individuals, whose only commonality is their need for skilled nursing care, will be in harmony with what they *wish, think, and feel*.

The dimensional size of the physical environment should be matched to the activities and group size being accommodated. If the physical environment is too small, overcrowding occurs. Too large, and the group may be overwhelmed by the space, therefore losing the intimacy and comfort associated within residentially scaled environments. The influence of geometry cannot be underestimated as a factor in creating appropriate scaled environments. Resident bedroom spaces require a given area (approximately 13 feet by 20 feet), a means of access into the space and enough exterior wall for placement of a window. When arranging more than ten or twelve resident bedrooms in a plan, one of two things occurs. Either the social areas around which the bedrooms are arranged become oversized, or resident rooms must be located along corridors leading to and from the semi-private, social areas of the household. Shared bedrooms alter the geometry somewhat, as these rooms only require a single entry door and bathroom for two sleeping spaces. But use of shared rooms provides only marginal advantages in the geometry of the arrangement.

Examples of designs that are described as households or sometimes neighborhoods that accommodate from 16 to 24 residents are inconsistent with the concept of a true household. Primary groupings of living and dining areas for this magnitude of group size may be far better than the 40 -60 resident groupings they replace, but once the quantity of twelve residents is exceeded, it appears that the positive potential of the household model is diminished and confused. One exception however, may be in the case of short-term stay populations. This population group often is comprised of younger "patients" residing within a short -term stay

nursing home to receive intensive physical or occupational rehabilitation therapy after a hospital stay. These patients have no desire or inclination to remain as residents of the facility. Short-term rehabilitation facilities offer a high-tech, high-touch environment reminiscent of a hotel or spa experience. In this situation, larger scale social areas and patient rooms located along corridors may be a reasonable response to a transient population concentrating upon "graduating" out of the program.

The third factor that influences household size is the ratio of direct care staff to the number of residents being served. Ideally, the residents of a household would be served by at least one dedicated resident assistant during each of the day, evening, and night shifts. Additional staff would then be added during the heavier care day and evening to assure that residents receive the assistance needed. This can be a difficult balancing act since required assistance can vary considerably depending upon the acuity level of the residents being served, or even from one day to the next, as resident well being changes due to short term episodes of sickness.

Multiple households that are interconnected, have greater flexibility in either adding staff as needs increase, or reducing staff levels during the night shift when one assistant can cover multiple households under one roof. Adjustments in staffing levels are more difficult to achieve in the case of separate detached, Green House® or Small House models where staffing can never be reduced to less than one staff member per household.

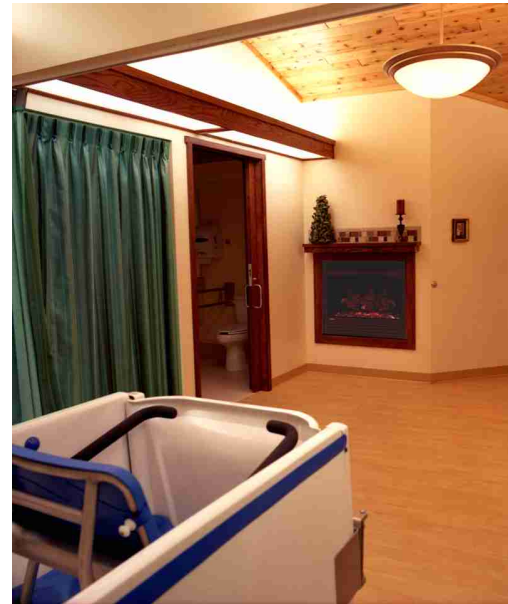
## **Flexibility for a Variety of Population Groups**

Small clusters of residents within household scale environments provide the opportunity for operators to develop individual strategies in the grouping of resident populations. Some care providers may chose to group residents with similar "diagnoses" or care needs, together within homogenous household settings. This calls for specialized staff trained in particular interventions necessary to care for specialized populations. It may also enhance camaraderie among residents with similar backg rounds and experiences. Other reasons for homogenous grouping may be funding and referral advantages as in the case of the Green Houses<sup>®</sup> of Chelsea, Massachusetts where plans call for houses identified by different populations including people with Lou Geh rig's Disease (ALS), AIDS, Hospice, or the most common special population group, those with Alzheimer's or other dementias.

Other care providers prefer to allow houses to fill organically with the intention that, over time, staffing requirements among houses may equalize as each house gains a heterogeneous population with a mix of heavy care and lighter care residents. This philosophy reinforces the concept of home in that, once a resident moves into a room, and becomes part of a household they can remain as long as desired without the need to move again.

## **Deinstitutionalize Clinical Resources**

Providing a normal living environment requires intentionally working to eliminate, or re-envision the many clinical elements found within the traditional institution al setting. Even within smaller scale environments, the need remains for staff to complete tasks such as charting, distribution of medicine, processing soiled items, and bathing residents. Many examples of innovative, homelike solutions are currently in us e including the staff work area, medicine distribution cabinet and bathing room illustrated below.



Creekview - Medicine Island (foreground) and Staff Work Desk

Creekview

- Bathing Spa with Fireplace

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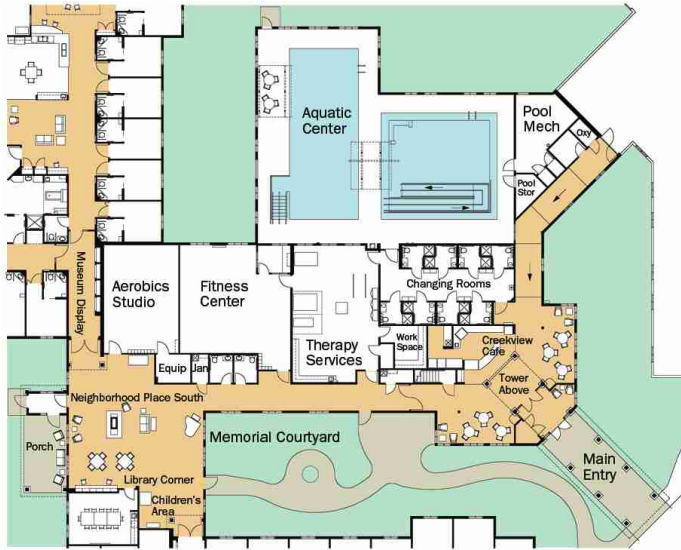
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### **The Neighborhood - Enabling Relationships within Community**

The household models encompass the *private* and *semi-private* zones within the *hierarchy of space*. Yet in creating a quality of life that encompasses life in all its fullness it is necessary to maintain relationships with the greater community and culture. These types of relationships occur best within the *semi-public* and *public* realms.

We all need to get out of the house on occasion to meet with others and participate in a wider range of activities than may be available within our immediate "family group." In order to engineer one's life to maximize high flow activities (*Working, Studying, Driving, Hobbies, Sports, Movies, Talking, Socializing, and Sex*), a variety of opportunities must be reasonably available. Not all activities and personal encounters can be pre-planned. There is value in serendipity and chance meetings that require exposure to a larger community. A neighborhood center shared among several households also encourages participation from members of the greater community can serve this function. Large group activities, religious services, music, theater and fitness opportunities within easy access can be made available to residents. At Creekview at Evergreen Retirement Community, a

fitness center including a warm water aquatic therapy center, providing memberships to community elders is located in the heart of the nursing home (Figure 9). By providing a hub of activity within the nursing home, residents' lives are enhanced through greater opportunities, while at the same time demonstrating to the community that aging is a natural part of life and the nursing home is not the last place one would like to find oneself.



(Figure 9)

South

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Creekview - Neighborhood Place

© Nelson•Tremain Partnership



Creekview - Aquatic Center

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Creekview Café'

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## **Household Models and the Regulatory Mileau**

Ten years elapsed between the initial conception of the household in 1987 and its realization with the opening of Creekview at Evergreen Retirement Community in 1997. This time lag resulted from a need to clearly understand the impacts that such a radical reworking of the nursing home would have on the physical, operational, and financial aspects of the sponsoring organization. It was also necessary to gain the support of regulatory agencies that, in their conceptual review, identified over 100 potential areas of regulatory conflict. With the assistance of a small-scale pilot project of eight beds within a portion of the existing nursing home, and some creative problem-solving by the entire team, including some helpful regulators, this list of conflicts was reduced to just a handful of issues that were able to be addressed without waivers.

This positive ending might cause one to believe that the creation of household model nursing homes is not impeded by regulations and that any organization should be able to replicate the process and outcomes pioneered by early household advocates. This however, is not the case. Even within a supportive State regulatory environment that enabled the creation of Creekview, subsequent Wisconsin projects encountered similar difficulties. This can be attributed to the fact that no two projects or sponsors are identical, and that interpretations and "alternative methods" for compliance are always individual and specific in their application. Education and negotiation with code officials and regulators, often over seemingly small issues, must occur over and over again, one project after another.

During the past twenty years of working to create small-scale environments that enable a normal life of quality for nursing home residents, we have encountered a number of recurring issues. It is discouraging, having worked diligently to gain acceptance in one situation, to start over again in the next to gain favorable interpretations, receive waivers or be denied approval for nearly identical concepts and designs. The following is a review of recurring regulatory hurdles that are commonly encountered.

## **Overlapped, Confusing and Contradictory Regulatory Jurisdictions**

An often heard complaint of facility operators and designers is that various regulatory agencies have overlapping and at times conflicting requirements. A single project may be required to comply with three or four separate regulations addressing the same issue. A common example is that facilities must meet the local building code requirements that protect occupants against a variety of life safety issues. Nursing homes are also required to comply with the NFPA 2000 Life Safety Code. On top of this, many state or local jurisdictions and their fire inspectors have adopted more recent editions of the NFPA Life Safety Code (either 2003 or 2006). State licensure regulations also have extensive requirements that cover many of the same life safety concerns. It is inevitable that the requirements from four separate regulations or standards will contain contradictory requirements, of which the design team is required to determine which is the most restrictive. Similar situations occur with requirements pertaining to food service operations, accessibility standards, and elevators, to name a few.

Several years ago the State of Wisconsin reorganized the method by which health care facility plan reviews and approvals are conducted. A process that formerly involved several jurisdictions including the state health department, fire marshal's office and building codes division was consolidated into a single review. All health care facility plan reviews within the State are now conducted solely by the health department. This provides a clear and direct jurisdictional responsibility. One significant advantage to this situation is that in the case of conflicts between various codes and standards, facility operators and designers are no longer put into the situation of trying to mediate solutions between multiple bureaucracies. Conflicts and discrepancies are able to be solved by working within a single state agency.

***Recommendation: States should be encouraged to develop methods whereby plan reviews for health care facilities are consolidated under a single entity in order to minimize redundant and overlapping requirements.***

**Interpretations Approved in Plan Review are not Recognized at Final Inspection**



It is not unusual that during a final inspection survey, prior to occupancy, portions of the design that received approval or favorable interpretation during plan review, are found out of compliance by the survey team. This is the most costly time for compliance issues to be discovered and can lead to significant delays in people moving into their new home and compromises to the desired environmental outcome in addition to the financial costs.

In our practice, to alert owners to this potential, we have been required to include contract language within our owner/architect agreements that reads: "The Owner may request certain design elements that do not strictly comply with some regulations and codes. The Architect will work with the Owner to receive favorable interpretations, waivers, or variances of such requirements. Additionally, the Owner acknowledges that regulatory plan reviewer and field inspectors may interpret requirements differently leading to conflicting requirements that the Architect will endeavor to resolve in association with the Owner."

Facility operators and designers need to be given assurance that a plan approval actually has meaning.

***Recommendation: States should be encouraged to maintain consistency in the interpretation of codes and regulations. This can be accomplished by requiring that Plan Reviewers and Final Inspectors are the same person. This will create a situation where the regulator has an interest in the final outcome and firsthand knowledge of issues covered during the plan approval process. Additionally, a mechanism for tracking and documenting interpretations (both positive and negative) would help maintain an institutional memory in case of staffing changes.***

### **Kitchen Spaces Open to Corridors**

An open floor plan that eliminates barriers, allows interconnection among spaces and easy access by residents, is one of the most critical features of the household model. Prior to the year 2000, providing spaces open to corridors was extremely difficult and required use of "suites of rooms," or the staffing of "nursing stations" on a 24-hour basis to provide direct supervision of the open spaces. Today, all model building codes have adopted language similar to that within the NFPA 101, Life

Safety Code, allowing spaces that are not used as sleeping areas, or for hazardous uses to be unlimited in size, provided appropriate fire suppression and smoke detection systems are installed.

Kitchens remain a difficult area of interpretation. *Cooking Facilities* are required to be protected in accordance with NFPA 96, using a commercial vent hood with specialty fire suppression systems (NFPA 101, LSC paragraph 9.2.3). An exception is allowed for "small appliances used for reheating, such as microwave ovens, hot plates, toasters and nourishment centers" that are exempt from "requirements for commercial cooking equipment" (NFPA 101, LSC paragraph A18.3.2.6).

The difficulty with these requirements occurs with the interpretation of what constitutes commercial equipment and the difference between cooking and reheating. Some jurisdictions allow the use of commercial, convection ovens for baking of bread and muffins, or even pizza. Others will not. Large "pannini grills" (a commercial size George Forman® grill) may be allowed to cook grilled cheese sandwiches, or pastrami on rye, while grilling a hamburger is not allowed. Is heating of a pre-cooked hot dog allowed, but not an uncooked sausage? The rationale for these requirements is that heating is different from cooking, especially in the case of foods that may produce "grease laden fumes." This is backed up by data that a large percentage of fires within nursing homes originate in kitchens, with *Confined cooking fires in kitchens* accounting for 24%; and *Kitchen or cooking areas* 19% of all nursing home fires (March 2006 NFPA Report "U.S. Fires in Selected Occupancies").

These statistics do not however, differentiate fires by size of kitchen or number of meals being produced. There is a quantitative and qualitative difference between a large commercial food service operation and a household kitchen producing family-sized meals.

In consideration of these differences, the Minnesota Department of Health (MDH) has developed a *Waiver for Neighborhood Kitchens*. Recognizing that flexibility in timing of the breakfast meal will improve the quality of life for residents with varying morning routines, this waiver was developed to allow cooking of breakfast within "neighborhood" size groups, using residential kitchen equipment. There are a number of requirements that must be met in

order to allow this waiver including: the kitchen serves 25 or fewer residents; breakfast preparation is only for those residents and staff in the neighborhood served by the kitchen; breakfasts are served sequentially, meaning that breakfast is served on the residents' schedule and that gathering of all residents at one time is not allowed; a residential range must be electric with key-operated disconnect switch; and a residential vent hood may be used that exhausts directly to the exterior provided meats that produce grease as they cook are prepared in a commercial kitchen. Other requirements, not related to fire safety also apply and will be discussed in a later section.

The MDH neighborhood kitchen waiver is an excellent *initial* response to this important issue, however, expansion of this concept to allow the cooking of lunch and dinner meals without stringent limitations on the types of food allowed to be cooked, needs to be addressed. Costly, commercial vent hoods required to comply with NFPA 96 are an impediment to the creation of normal homelike environments providing the activities and aroma of mealtime preparation. Strict adherence to the current requirements may contribute little to the protection of resident life safety when less costly alternatives are available. A recent federal government workshop identified that a single sprinkler head in a residential kitchen would be an effective fire suppression measure, although the best situation is a fully sprinklered residence in accordance with NFPA 13D, 13R, or 13 (NIST Special Publication 1066, 2007). Nursing homes are already fully sprinklered, thus meeting this finding.

***Recommendation: Research needs to be conducted to determine the actual life safety risks associated with cooking fires in small-scale operations. Alternatives to NFPA 96 standards for protection of cooking equipment must be allowed in the case of small-scale environments. It must be recognized that residential scale kitchens, fully protected by fire suppression systems provide adequate life safety without additional fire suppression measures. Similar alternative consideration must be made for small-scale operations including facility cafés and delis that serve limited menus for visitors, staff and residents.***

### **Protection against Non-Fire Dangers in the Kitchen**

In addition to fire safety, there are many regulations that are intended to protect residents against perceived or real dangers in

the kitchen. These typically include protection against food borne illness or physical safety against injury.

National Sanitary Foundation International (NSFI) requirements provide specification of materials and equipment to reduce the spread of disease. Yet these requirements make no distinction between large and small food operations. Requirements within small-scale households for 6" sanitary legs on cabinets, and commercial refrigeration and dishwashing equipment, impinge on the residential nature of the environment, adding significant cost without proven protection against risks. In the case of dishwashing equipment, there is no difference in sanitation between residential and commercial equipment as evidenced by tests conducted at Evergreen Retirement Community under the supervision of the Wisconsin State Department of Health. Other facilities using commercial equipment within household settings have found that dangers to residents actually increase with the addition of these unfamiliar hot surfaces and steam in the kitchen. True disinfection of surfaces only occurs at temperatures far higher than the 180 degrees required by NSFI.

Protection against physical harm typically includes requirements to secure noxious chemicals, or dangerous items such as knives, and appliances. Anecdotal evidence indicates that, within a normal residential environment, residents retain an understanding of potential risks associated with many such dangers, and that safety measures built into facilities are often not implemented once the facility opens.

Recognizing the benefits of normal home environments, the *Waiver for Neighborhood Kitchens* in Minnesota also addresses these additional safety issues. Although Minnesota still requires commercial dish washing equipment, residential style cabinets are allowed with NSFI laminate countertops and durable laminate interior surfaces, and breakfast foods may be stored in residential refrigerators overnight. The kitchen may also be used for activity programs. Though a key-operated disconnect for the range is required, use of the switch and securing of other items is not mandated. This waiver program is also recognized by the Minnesota Environmental Health Division, charged with food safety, which also allows similar arrangements within assisted living and adult day facilities.

***Recommendation: Exceptions to compliance with NSFI requirements should be provided for small-scale food preparation areas. State and local regulatory agencies should be encouraged to defer food service sanitary oversight to long-term care regulators who are more familiar with the needs of nursing home residents. Research needs to be conducted to determine the need for commercial food service requirements within small-scale operations.***

### **Laundry Facilities**

Many state health requirements mandate separation of soiled and clean processing areas within a laundry. It is unnecessary and impractical to provide separate processing areas within small household-scale environments. In these settings there is less risk of cross contamination and infection and operational measures can be taken, such as washing individual resident clothing separately if needed. In Wisconsin, the personal laundry and soiled utility areas rooms are allowed within the same area, provided air flow is provided in the direction from clean to soiled. This is a reasonable approach to clean and soiled functions sharing a space without requiring separation by walls.

***Recommendation: It should be made clear that in small-scale operations, separation of clean and soiled areas is not required.***

### **Handrails**

According to a CMS Survey & Certification letter (12/21/06), "The purpose of the handrail is to assist residents with ambulation and/or wheelchair navigation." The need for handrails is clearly an artifact from the corridor-based model of facility design. In facilities with long corridors, residents are required to navigate the corridors in order to access activities of daily living not available within one's "private" bedroom, including dining and social activities. Within a household, the need for and desirability of handrails is significantly reduced, if not eliminated. Household corridors are an extension of the semi-private social spaces.

Requirements for handrails limit the potential to fully utilize circulation spaces for meaningful and valuable activities. In some

configurations, resident bedrooms are literally "across the hall" from the country kitchen, and often only short distances must be traversed to access other activities. Participation in daily activities is directly influenced by proximity and ease of access, and the intrinsic design of a household maximizes each, providing a significantly greater "mobility enhancer" than any handrail.

It is unreasonable to require handrails along "each side" of a corridor that separates spaces allowed to be open to the corridor for life safety purposes, thereby "fencing off" and limiting direct access to these spaces. This situation has occurred, and has been vigorously supported by some state regulators.

Inclusion of furniture along walls of corridors can provide resting points for elders, thereby improving ambulation while enhancing hominess. Handrails interfere with use of wall space in this manner.

***Recommendation: Handrails should be explicitly exempted from installation along spaces open to the corridor. Handrails should be allowed to be discontinuous to allow for furniture placement and other installations (e.g. display cases, artwork, etc.), that do not reduce the required width of egress. Alternatives to handrails, such as "lean rails" (plate rail design for stability) should be allowed.***

#### **Protrusions into the Corridor Width**

There are conflicting requirements as to the allowable distance elements may protrude into the width of corridors. NFPA 101, LSC allows only 3 ½" protrusion, while the Americans with Disabilities Act Architectural Guidelines (ADAAG) allows 4" for items within 6'-8" of the floor level. Unfortunately many industries, such as lighting manufacturers utilize ADAAG standards in design and manufacture of products. Compliance with NFPA 101, LSC precludes the use of typical elements of home, including furniture, plants or wall mounted, sconce lighting fixtures.

Many CMS regional offices have interpreted that the 3 ½" protrusion applies to all corridors, regardless of width, meaning that in the case of corridors that exceed minimum width

requirements, protrusions are still limited to 3 ½" even though the required exit width is maintained.

***Recommendation: Protrusions within corridors greater than 3 ½" or 4" should be allowed within defined circumstances. Explicit allowance should be made for protrusions that are unlimited in dimension, provided the required exit width is not reduced in excess of a specified (4") distance.***

#### **Eight-Foot Corridor Width**

There are only two provisions within the Life Safety Code that have nothing to do with life safety within health care occupancies. These are the requirements for windows in resident rooms and the requirement for eight foot wide corridors. No one would promote the elimination of windows, but eight foot wide corridors are another matter. This requirement has been rationalized as the minimum width necessary to push beds or gurneys past each other. If this is the case, what happens in a fire emergency when two beds are blocking the fire exit at the end of the corridor? Emergency procedures do not include the transportation of residents in their beds. This requirement may have had a functional basis in the case of hospitals but is costly and unneeded requirement in nursing homes.

***Recommendation: Eliminate the requirement for eight foot corridors in nursing homes perhaps considering six feet instead.***

#### **Three Foot - Eight Inch Wide Administrative Office Doors**

Regional CMS offices are requiring that doors to offices for administrators, directors of nursing and social workers be 3' -8" wide and located on an eight foot wide corridor. This requirement is based upon the assumption that residents must be provided access to these important administrative personnel, while being transported in their bed. There are certainly more dignified, alternative methods for providing such access that do not require construction of excessively wide doors and office corridors.

***Recommendation: CMS should make it clear that alternative and dignified means of access to administrative services are allowable without requirements for wide halls and doors.***

#### **Direct Line-of-Sight as Control over the Corridor**

When staff members are assisting residents and performing meaningful care tasks, they are most often within the resident room or bathroom, with no visual connection to public spaces. This need for visual control has been rationalized as providing quick assistance to a resident who may fall, yet most falls occur within private resident rooms. No one would suggest line-of-sight into all bathrooms. Requiring visual control is an outdated concept that does not recognize the realities of nursing care, nor the advances achieved through communication technologies.

***Recommendation: CMS should stipulate that a requirement for direct line-of-sight from staff work areas or "nursing stations" is not required within nursing facilities.***

#### **Distance to the "Nurses' Station"**

Many state requirements include maximum travel distance from a nursing station to resident rooms. These requirements assume that a fixed nursing station is required for staff to perform their work and for electronic calls to be received. There are many approaches to resident care that do not necessitate a fixed location. The only requirement should be that adequate staffing levels be provided to meet the care needs of residents.

***Recommendation: CMS should stipulate that no fixed location is required for nursing staff to care for residents.***

#### **Wired and Wireless Call Systems (UL 169)**

Requirements that various alarms or notification be directed to a nurse station or other permanently staffed location does not recognize the reality that nursing staff do not remain in fixed locations. Technological advances in resident to staff communication systems that do not require the use of hard wired systems can provide superior performance, allowing resident



assistants and nursing staff to respond to resident calls from any location.

***Recommendation: Consistent specifications for wireless call systems should be defined that eliminate the need for individual state regulators to evaluate the efficacy of multiple nurse call systems.***

#### **Security against Residents leaving Unescorted vs. Fire Safety**

To address the issue of security against residents leaving the building unescorted, the State of Minnesota Department of Health, Department of Administration, and Office of the Fire Marshal met with designers and operators to devise a methodology by which health care facilities could secure areas of buildings through the use of magnetic locking devices with keypad controls. Locking of facilities was important not just in long-term care populations but also as a means to secure patients of hospitals against outside intrusion after a series of high profile abductions of newborns and gang related shootings. Minnesota's *Special Emergency Egress Control* required that magnetic locks must be interconnected to the fire alarm system, as well as, provide a manual control whereby nursing staff could release the lock in case of non-fire related emergencies. This process demonstrated the ability of several State agencies to work out a solution that met the needs of caregivers to protect patients and residents and to address the legitimate life safety concerns. This provision in the Minnesota state regulations worked alternative solutions to egress and security issues for a number of years. Unfortunately, regional CMS enforcement of the NFPA 2000 provision that *delayed egress devices* (NFPA 101, LSC 2000, Paragraph 7.2.1.6.1) are the only allowable means to secure exits, eliminated this well thought out option.

***Recommendation: The risks surrounding security against intrusion or residents leaving unescorted are equally as legitimate as those for fire safety. It is unreasonable to believe that delayed egress hardware is the only safe method to secure a path of egress. Alternative methodologies such as Minnesota's Special Emergency Egress Control should be allowed.***

#### **Security for Outdoor Spaces**

Access to the natural environment is an extremely important quality of life measure. Securing exterior yard space is difficult to achieve given the requirement that two egress controlled doors are not allowed (only one delayed egress device is permitted) within a means of egress. It often is not possible to provide an area of refuge fifty feet from the exterior face of a structure. Alternatives must be made available that allow safe yet secure access to outdoor areas.

***Recommendation: Yard spaces should be allowed to be independently secured with provisions for emergency egress in case of fire.***

### **Smoke Compartment Requirements**

Nursing home fire safety requirements are based upon a concept described as "defend in place." This concept recognizes that the population groups served within these facilities may be incapable of independent exiting in an emergency due to reduced cognitive or physical capabilities. Therefore buildings are constructed using safety standards that are intended first, to limit the spread of a fire from its origin and second, to allow movement of residents to another compartment of safety, on the same level within the building, eliminating the need for an exit. In the case of large facilities, this requirement would typically provide "smoke compartments" serving between twenty and sixty resident rooms. In the case of small facilities with open floor plans, the provision of separate smoke compartments may be difficult, without compromising the physical proximity of resident bedrooms to the semi-private social areas of the household. Most household scaled environments are far smaller (from 6,000 -12,000 square feet) than the allowable 22,500 square feet allowable within a smoke compartment (NFPA 101, LSC paragraph 18.3.7).

***Recommendation: The requirement for subdivision of small-scale household environments into two separate smoke compartments should be evaluated as to its efficacy and impact on the living environment for residents.***

### **Accessibility Standards**

Accessibility standards as defined by the Americans with Disabilities Architectural Guidelines (ADAAG) do recognize the fact the strength and stature of older people differs significantly from that of independently functioning disabled individuals. In the case of nursing environments , current ADAAG standards hinder the safe and effective care of people requiring assistance with activities of daily living as they require institutional grab bar configurations that are of little use, such as requiring grab bars located behind toilets.

***Recommendation: Within care environments where residents are assisted with transfers, research should determine the optimal range, as opposed to extreme range, of use to determine the required size and location of grab bars. Extension of side grab bars from the back wall should be reduced to allow shorter, fold-down bars and rear wall grab bar requirements should be eliminated.***

#### **Sliding Doors in Low Occupancy Areas**

Building codes have stepped backward by no longer allowing sliding doors in low occupancy spaces such as resident bathrooms. Sliding doors provide superior utility in these situations by providing door operation that as easily within the ADAAG specified range of motion without the need to maneuver wheelchairs backwards in tight quarters. Sliding doors also have no "door swing," thus requiring less floor space. Many state health departments also preclude use of sliding doors.

***Recommendation: Sliding doors must be explicitly allowed within all occupancy types within rooms serving low occupancy spaces.***

#### **Separation between Nursing Home and Daycare Occupancies**

State licensure requirements often require a two -hour occupancy separation between nursing home and daycare (either child or adult) occupancies. Significant benefits are gained by the provision of opportunities for intergenerational activities within long term care environments. This requirement does not seem

reasonable particularly in the case where the daycare meets the same construction classification as the adjoining nursing home.

***Recommendation: Intergeneration programming should be encouraged to the greatest extent possible by allowing programs to co-exist under one roof.***

### **Allowance for Use of Personal Furniture**

CAL 133 is a flammability standard for upholstered furniture that has been adopted in many jurisdictions. This standard was developed to limit the fuel load within certain public occupancies including nursing homes. The original standard was developed with an exception for occupancies that are protected by a fire protection system. This exception has been eliminated or severely restricted in many jurisdictions. For example, the Minnesota Fire Marshal promulgated rules that limit residents to one piece of upholstered furniture, within their own bedroom, that does not meet commercial furniture standards. This is a restriction that limits resident rights based upon overzealous fire officials' individual determination of risk. Asbestos was once used in the name of fire safety, now the fire retardant chemicals used for several decades are being linked to cancer deaths and California is attempting to outlaw their use ([www.latimes.com/news/local/la-me-couches7mar07,1,3742510.story](http://www.latimes.com/news/local/la-me-couches7mar07,1,3742510.story)). Where are the greater risks?

***Recommendation: It must be made clear that resident rights to use their own furniture should not be limited within fire sprinklered buildings.***

### **Standards for Small-scale Environments**

By definition, a nursing home is "A building or portion of a building used on a 24-hour basis for the housing and nursing care of four or more persons who, because of mental or physical incapacity, might be unable to provide for their own needs and safety without the assistance of another person" (Paragraph 3.3.132, NFPA 101 LSC 2000).

Four residents is an extremely low threshold when 16 is common within other occupancy types. It needs to be recognized, as it is within other occupancy classifications such as Board and Lodging, that the level of risk in small facilities is not as great as in larger facilities and that different requirements are reasonable.

***Recommendation: Separate Life Safety and Building Codes must be developed to provide appropriate but less stringent requirements than those currently allowed for small-scale environments.***

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