For many of us, the scariest part about growing old is not wrinkles and gall bladder operations, but where we will be living. Older adults want to live out their lives at home, yet this is not always possible. The demands for care increase with age, and for most families, the ability to provide constant attention with activities of daily living such as bathing, dressing, feeding, toileting and walking is simply not possible.

In addition, the United States is experiencing a dramatic shift in the age of its population coupled with an increase in life expectancy. Today, about 13 percent of the population is over 65 and that number will double to more than 25 percent by 2030, according to U.S. census data. In addition, according to the same source, those 85 and older are the fastest growing segment of the population.

As a result of a population that is living longer, more and more people will need help in their final years. One of the most welcome developments in recent years for seniors and their families has been the expanding number of assisted living facilities. In 2000, there were over 28,000 assisted living facilities in the U.S., housing more than one million seniors. Assisted living facilities are the fastest growing area for new senior housing in the U.S.

Skilled nursing care facilities are also on the rise. According to the federal Health Care Financing Administration, there are approximately 33,000 of these facilities in the U.S., and according to the State Policy Clearing House of the Alzheimer's Association, more than 50 percent of these residents are estimated to have Alzheimer's disease or related disorders.

So it comes as no surprise that designing senior care environments presents unique and formidable challenges. However, there are also significant rewards. In addition to the rapidly growing need for these facilities and the potential benefits for business, design professionals have the unique opportunity to make an invaluable contribution by creating settings that encourage exploration, movement and social interaction, which are vital for maintaining a good quality of life and health in an elderly population.

**Aging is a process, not a disease**

In designing for senior care environments, design professionals often ask, "What is normal?" To answer that question requires an understanding of how seniors experience and interact with their environments. First, aging is not a disease, but a natural on-going process. Second, most residents are in their 80s and older. As such, they are experiencing the effects of the normal aging process, which include sensory losses, visual impairment, hearing loss, mobility loss with decreased muscle strength and reflex time, as well as lower energy levels.

The following provides more details about how we change as we age, as well as guidance for designing safe and attractive indoor environments for seniors:

1. **Vision is by far the most important sensory channel.**
   Approximately 90 percent of all information most of us learn in a lifetime comes through our eyes. Normal age-related changes disrupt
our capacity to see, including:

* impaired ability to adapt to changes light levels;
* extreme sensitivity to glare;
* reduced ability to discern visual details;
* restricted field of vision and depth perception;
* reduced contrast sensitivity;
* restricted color recognition.

As a result, lighting needs for seniors are quite different from those of younger people. To see and function normally, most seniors in their 80s need at least five to eight times more light than people in their 20s. Add to this the tremendous number of seniors who have cataracts (blurred vision) and glaucoma (a narrowing field of vision that may eventually lead to loss of vision), and it becomes obvious that proper lighting is critical. Improper lighting can curb mobility and even hearing, because many seniors with diminished hearing use lip reading to interpret words they cannot hear clearly.

**The Design Response:**

* **Raise the level of illumination and keep it consistent.**
  
  To older eyes, uneven brightness can create the appearance of "steps" or "edges" at locations where light and shadows meet, resulting in depth perception problems. In addition, uneven or jarring differences in light levels can cause disorientation and increase levels of agitation and confusion.

  The proper level of lighting combined with appropriate task lighting can help discern details. In short, lighting needs to be at consistent even levels. Gradual changes in light levels, particularly in transition spaces between outside daylight areas and indoor spaces, are also important.

* **Provide access to natural daylight.**

  Natural daylight has all but been eliminated from most senior living environments. This is unfortunate, because research has found that sunlight stimulates the circadian and neuroendocrine systems and helps keep the body's systems and functions in balance.

* **Eliminate glare.**

  Glare has a tremendous impact on behavior. It not only reduces comfort, but it also produces confusion, agitation and anger in seniors as they try to cope with this invasive light source. Direct glare comes from inappropriately shielded light sources and from daylight streaming into a too-dark room. Reflected glare is created by strong light bouncing off a smooth reflective surface. Lighting from the ceiling or through a window and reflecting off highly polished floors creates "hot spots" that can be blinding.

  As one 89-year-old resident in a personal care unit noted, "The glare off the floor just throws me! Going down the hall is the worst part of the journey." These floors can unintentionally be a "passive restraint" when seniors are afraid to walk for fear of falling.

  To eliminate glare, designers are turning to soft surface floor coverings (such as carpeting) in a variety of textures, patterns and colors; matte finishes for paints and wall coverings; and soft patinas for furniture and other surfaces.

* **Enhance with color, accent with conservative patterns.**

  Light and color relate to more than just illumination or aesthetic value. They also influence our sleep, wakefulness, emotions and health. Many seniors, however, see color, patterns and textures differently than younger people.

  As we age, the lens of our eye hardens, thickens and becomes more yellow. To understand how many seniors see colors (with a yellow tint),
look through a piece of yellow cellophane. Research has found that seniors are best able to discriminate highly saturated colors at the “warm” end of the light spectrum, such as shades and hues comprised of reds, oranges and yellows. Also, colors with a high degree of brightness are particularly visible.

Designers should use color to provide good contrast, and should use yellow acetate or cellophane to screen for color selections. Contrasting hues from adjacent parts of the color wheel are best avoided.

Like color, pattern and texture enhance any design environment and have tremendous therapeutic potential; for seniors, special care needs to be taken to avoid high-contrast geometric or graphic patterns. These patterns may seem to move, contributing to feelings of unsteadiness and instability. Designers should take a conservative approach when choosing patterned flooring or fabrics.

2. Hearing also is affected by age.
High frequency pitches become less audible as we age, and we have less sensitivity to lower frequency pitches. Hearing loss not only produces self-doubt, which affects self-esteem, but also has direct links to physical health.

The ability to understand normal conversation is usually not affected at first, but when combined with the presence of background noise, comprehension is often diminished. Background noise can be particularly painful when magnified by hearing aids. Excessive noise echoing from hard surfaces, for example, can cause frustration, agitation and anger. It also can cause elevated blood pressure, heart disease and ulcers.

The Design Response:
* Good acoustics = less noise.

In a well-designed space, it is not necessary to speak loudly to be understood. A room that has soft (sound absorbing) and some hard surfaces (furniture) placed appropriately within the space make communication easier by allowing occupants to talk more softly. Designers should select interior surfaces and furnishings that do not reflect or amplify sound waves. For example, wall surfaces with niches, ceilings with irregularly recessed sections, and soft-surface floorings diffuse sound waves. Incorporating an adequate amount of carpet, acoustic tiles and fabric in a space also provides a quiet area.

3. Mobility typically declines as we enter our 80s.
Motor skills directly impact our ability for getting around, and when regular exercise is not practiced, balance can be affected, leading to falls and fractures. In addition to limited mobility, many seniors also have arthritis, osteoporosis or both. Arthritis ranks second only to heart disease in the number of disability claims filed each year. According to a recent Center for Disease Control and Prevention study, one in three adults have arthritis or chronic joint pain, making it the nation's most crippling disease.

Osteoporosis, a form of arthritis, is a devastating disease that is very common in seniors. It robs the body of bone density and is the single most important risk factor for fractures. This is an especially critical issue, because 94 percent of hip fractures occur in people over age 50 and more than 30 percent of hip fractures result in death.

The Design Response:
* Floors are critical.
Falling is a frequent occurrence among many seniors. This can lead to fear of walking distances alone, particularly on hard surfaces. Designing spaces that aid independent movement, whether with canes, walkers or wheelchairs, can preserve and support mobility.

It is worth noting that seniors often find themselves in wheelchairs.
before they have truly lost their ability to walk because of inadequate interior design accommodations. To give seniors more options, designers can specify handrails as a part of the interior design. Appropriate handrail designs allow seniors to grip the rail for balance and security. An oval shape, with a broader, flat surface allows arm support, without relying on grip strength. Also, frequent places to sit and rest are essential for hallways, large rooms and passages between buildings.

Mobility is further assisted by sensory comfort. Creating a walking environment that is free of glare and escalating sounds not only soothes frazzled nerves, but also encourages confidence in venturing about.

Next month: the authors will explain in greater depth some of the key factors to consider when specifying flooring in a senior care facility.

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