I wish we could take credit for this entire piece but the credit belongs to National HealthCare Corporation who have graciously allowed us to reproduce it in its entirety for our readers. Our own recommendations on the heating, ventilation and air conditioning system supplement the messages on health, wellness and comfort. It is one of the best pieces we’ve come across on designing buildings for mature individuals...its called:

Senior Friendly Living
Environmental Design for a “Senior Friendly” Home

National HealthCare Corp. has been a leader in health care since 1971. Our founder, Dr. Carl Adams, had a vision for continued health and vitality in our senior years. As baby boomers age, we are committed to living independently as long as possible. Below, you will find information concerning the normal aging process and helpful tips for creating a “senior friendly” environment. These tips were initially developed to assist building contractors in creating retirement communities. However, most of these changes can be incorporated into existing housing.

Environment and Aging
In order to understand design criteria and recommendations for housing for elderly persons, one must first be aware of the functional needs of the residents. One must consider that aging is a process, and the functional levels of each individual will generally decrease at different rates. The ability of an older person to negotiate the environment will also fluctuate from day to day, dependent upon having a “good day” or a “bad day.” For the environment to be compatible with changing functional levels, “adaptability” must be provided wherever economically feasible. Adaptability should allow for the adjustment of the
The heating, ventilation, air conditioning systems has a direct and immediate impact on health, wellness and comfort. ASHRAE Standard 55 is the only recognized method of specifying environmental design as it relates to temperature, humidity, air movement, clothing etc.:

**Hearing**

Older persons may experience difficulties discriminating normal conversation against a background of competing noise, which may be generated by the *building's mechanical systems*, vehicular traffic outside, foot traffic inside, echoes in large spaces, music, dishes being moved around, and other conversations. As hearing loss begins to occur, high frequencies will not be perceived, also affecting the older person’s ability to respond to warning signals.

**Vision**

As the eye ages, the lens hardens and yellows. The hardening of the lens, which occurs unevenly, will cause bright rays of light, or glare, to be misdirected within the eye, impairing vision. This vision impairment will also occur when an older person is sitting in direct sunlight. The pupil dilation and contraction rate is slowed, which impairs vision when the field of vision changes from dark to light areas. Older persons also require approximately three times the amount of light as younger persons to accomplish the same task without additional eye strain.

**Sense of Touch**

The sense of touch becomes increasingly important in that this sense, generally speaking, is not reduced as a mere function of age. As other senses diminish, the *older person will rely more on the sense of touch* to pick up stimuli from the environment. Institutional environments, as well as homes, however, have historically been devoid of tactile stimulation as a trade-off for ease of maintenance. The older person has, therefore, been deprived of compensating through the use of this information source.

**Orientation to Time and Place**

As short term and long term memory loss begin to occur (in many cases accelerated due to relocation trauma), orientation to time and place becomes increasingly important. Most older persons are more familiar with square or oblong spaces and are confused by the so-called “contemporary designs,” which introduce spatial areas with numerous angles in circular patterns. Elements should be designed into the environment which can be changed for various seasons. Clocks and calendars should be prominently located. Special daily events should be posted and highlighted.

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*The PMV (predicted mean vote) model combines four physical variables (air temperature, air velocity, mean radiant temperature, and relative humidity) and two personal variables (clothing insulation and activity level) into an index that can be used to predict thermal comfort. The index provides a score that corresponds to the ASHRAE thermal sensation scale, and represents the average thermal sensation felt by a large group of people in a space (ASHRAE, 2001; Fanger, 1970).*

*ASHRAE Standard 55-2004 (Reaffirmed 2009)*


*777 Tilia Creek, NE • Alhambra, GA 30223*
**Personalization**

Each individual, old or young, has the need to impose his or her personality upon the environment in which he or she lives. This may take the form of remodeling and/or redecorating a house or apartment upon occupancy. Once this has been accomplished, the new environment usually takes on the concept of “home.” Older people, due to the loss of family and friends, also place more personal attachment to furniture and household belongings. The environment should be designed to allow the older person the opportunity to use certain pieces of familiar furniture in various arrangements, and to display personal effects and pictures.

**Mobility and Agility**

The aging process is generally most noticeable regarding an individual’s mobility and agility. Arthritis and other muscular complications cause a decrease in finger dexterity, making various controls and latches difficult to manipulate. Limitation of reach becomes restricted between knee and shoulder height, and walking may require assistance through the use of assistive devices such as canes, walkers, and wheelchairs. Consider low pile carpet for ease of mobility for walking or wheelchair propulsion and low profile doorsills between rooms to help prevent tripping.

Head movement becomes restricted when the neck is craned from left to right or when looking up at the ceiling. Such prolonged neck strain may restrict blood flow to the brain and cause fainting. Leg movement becomes restricted, creating difficulties when ascending stairs and/or entering a bathtub. General mobility throughout the environment becomes increasingly more difficult. Activities of daily living become more time consuming and, in some cases, become impossible to complete.

Since aging is a process and not a stagnant condition, the level of mobility and agility changes continually. The degree of functional difficulty in the environment should be matched with the agility level of the individual. Since one’s agility level is continually changing, the environment must also be adaptable to meet these changing needs. One should also note that an environment which is too easy for an individual’s agility level can cause accelerated functional dependency. The ability to adapt a standardized environment to one’s physical stature and agility level has been accomplished and proven economical by automotive technology. This design concept is just beginning to be addressed in the residential environment and is drastically needed by older persons experiencing the aging process. Every effort should be made to make environments for older persons as adaptable as possible to meet their level of mobility and agility.

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“We do not seem to recognize that our real customer is the occupant, not the building.”

H.F. Levy, P.E.
Professional Engineer
Life Member ASHRAE

“thermal perception...factors can include demographics (gender, age, economic status), context (building design, building function, season, climate, semantics, social conditioning), and cognition (attitude, preference, and expectations).”

Considerations when relocating due to retirement or “down sizing”

When the decision is made to relocate for purposes of “down sizing” or retirement living, you should first look at the communities or areas that are most likely to meet retirement needs.

Some ideas to explore are:

- Does the community maintain all grounds – lawn mowing, fertilizing, raking leaves, in-ground sprinkler system, and/or weeding?
- Is a community pool important to you? Is it easily accessible to you? No community pool usually means a lower community maintenance fee.
- Is there enough privacy between homes, back yards, and/or patios?
- Is there available extra parking for guests, or will your driveway meet that need?
- Is the target age group for the community what you want?
- Do amenities meet your needs (Grounds maintained, pool, and/or club house)?
- Are the floor plan(s) such that steps/stairs can be avoided?
- Is there a master bedroom on the main level (if the home is multi-level)?
- Is there sufficient storage (for those things from which you simply cannot part)?
- Measure your vehicles! Is the garage tall enough, long enough, and wide enough?
- Is there a security system?
- Is there an emergency call system available?

The next step in downsizing is developing/adapting a floor plan or adapting an existing home.

Consideration

Snow melting system offer many safety, security and convenience benefits for adults wishing to remain at home during winter months.
Specific adaptations for creating a “Senior Friendly” Home Environment

Overall Considerations:

- NO steps from garage to house.
- NO steps from front porch or patio into the house.
- Door handles – levers instead of knobs.
- Floors that are not highly shined (which can cause glare or be slippery when wet).
- Floors that don’t show much dirt.
- Senior/comfort height toilets and counter tops.
- If carpeting is used, dense, low pile should be the choice.
- Consider using pressure mats, passive photoelectric sensors, or switch sensors, rather than motion detectors, which can interfere with hearing aids.
- Because alarms and doorbells are usually high in frequency, a buzzer is usually a better signaling device
- Heating system should be designed to avoid the need for space heaters.
- Lamps with easy on/off switches (typical knobs are difficult for aging hands). Touch lamps are especially helpful in the bedroom.
- Avoid placing extension cords across walking paths.

Room Specific Considerations:

Master Bath:

- No garden tub – instead, consider adding a make-up table and/or shoe closet (roll out), or a sturdy arm chair for dressing.
- Bathtubs are highly dangerous areas for seniors. Many senior falls in the bathroom are related to getting in and out of the bathtub. Showers are ideal! However, if a tub is the only choice, install several grab bars,
Shower Upgrade:

For a truly customized shower stall, consider adding heated walls and floors around the shower. This removes the thermal shock of warm wet skin coming in contact with a cooler surface.

- Shower – raised, wide seat, grab bars, and shower stall sized for easy cleaning (not too big, yet big enough for ease of movement).
- Senior/comfort height toilets and bathroom counters.

**Kitchen:**

- Every work surface should be well illuminated by task appropriate and/or general lighting.
- Lots of lighting in kitchen – under-cabinet lights and can lights, in addition to florescent lights.
- Be aware of the height and build of cabinets for storage – for example, install roll out shelves.
- Pantry should not be too deep – too difficult to effectively utilize space.
- Shelves should be shallow for easy viewing and reach.
- Oven – both small and large oven in same unit (day to day cooking, smaller, higher oven is used. Lower, larger oven can be used if assistance is available for lifting).
- Large dials on stove.

*www.healthyheating.com*
• Space for recyclables.

• A u-shaped galley kitchen is ideal (food can be slid along the counters rather than having to be carried).

• Easily operated microwave.

• Lever style faucet on the sink.

• Garbage disposal and trash compactor to eliminate trips to carry out trash.

• Ovens should have pull out racks.

• Kitchens should be planned so that a sturdy stool with a back is easily available, for resting when fatigued.

**Bedrooms:**

• Large bedroom upstairs to accommodate guests with ease. King beds in all rooms (if you have grandchildren, it will be easy to put up a port-a-crib, sleeping bags, or pull out sleeper sofas).

• Large closets – with easily accessible storage.

• Master bedroom on main level.

• Senior friendly bed height.

• Adequate night light.

• Room beside the bed for commode or wheelchair if necessary.

• Sturdy arm chair for dressing.

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**Consideration**

Mechanical equipment for heating, cooling and ventilation can transmit noises throughout the structure.

It can be particularly annoying in sleeping areas. All HVAC equipment should be located away from noise sensitive areas and if possible isolated from the structure using proper sound dampening hangars and supports.
Patio:
- Patios are a better choice than decks. Decks are high maintenance since they require staining and painting, are susceptible to rotting, and are generally slick when wet.
- Look for a lot or patio that facilitates privacy.
- Utilize low maintenance furniture that can remain outside year round.

Elevator:
If you are considering whether to add an elevator to your current residence or incorporating one in new construction look at the possibilities of:
- Eliminating or decreasing the size of a closet or pantry to make room for the elevator.
- Utilizing a dead corner of an upstairs landing.
- Making the elevator wheelchair accessible.
- Using an upstairs closet for storage space becomes feasible when items can be easily moved downstairs by the use of the elevator.

Furnishing the Senior Friendly Home:

Furnishings:
- Specially arranged seating areas can compensate for hearing and vision impairment (avoiding glare).
- Carpeting can reduce ambient noise by up to 70%.
- A wall of drapery can reduce ambient noise by 50%.
- Certain wall and floor coverings can facilitate a better listening environment.
- Furniture should have higher seats.
- Furniture should not have loose back cushions.
- Seating should be very firm.
- Seating should be at a comfortable height to facilitate getting up and down (to ease joint difficulties with knees and hips).
Chairs should have arms, again, to facilitate rising from the chair.

Carpeting significantly improves gait speed, step length and walking confidence.

Eliminate throw rugs (increases the likelihood of a fall, which can be very debilitating for seniors).

If throw rugs are necessary, anchor with rubber grips to prevent sliding and make sure edges are flush with flooring (not turned up).

Furniture should be anchored on hardwood and tile floors to prevent sliding (again, to decrease senior falls).

Chairs on coasters are a bad idea (increases chances for falls).

Chairs should not be too deep, making it too hard to get up.

All areas should have adequate lighting! Farsightedness increases and color acuity decreases with age. Increased lighting is a must.

Matching patterns on the walls and furniture is not a good idea. Distinguishing the beginning of one and the end of the other becomes increasingly difficult with age.

Dark floors may look like a hole or a pit to someone with vision impairment.

Contrast between the wall and the floor makes it easier to tell where one ends and the other begins.

Muted colors are calming, but bright colors are easier to distinguish.

Hallways need night lights.

Each room should be painted a different color.

Dark window coverings make the room too dark for most seniors (dark greens and reds are poor choices).

Front loading washers and dryers are ideal.
**Recommendations**

Downsizing is one of the best gifts you can give your children and grandchildren:

It enables you to allow other family members the opportunity to enjoy some of your family possessions.

At your death, your children have a less daunting chore of “cleaning out” their parents’ home.

In a community of similarly aged persons, friendships develop in which neighbors are more likely to have frequent communication (check up on each other).

With a senior-friendly home, the move to an assisted living or long term care center can be delayed considerably, or even avoided, when physical barriers to mobility are removed.

National HealthCare Centers and Assisted Livings Centers have incorporated the latest conveniences into each building to prolong mobility and individual independence for each resident.

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