LIGHTING THROUGH THE AGES

Indoor lighting needs age-friendly upgrade

Starting around age 40, a person’s ability to see gradually diminishes. Statistics estimate one of the 78 million U.S. baby boomers turns 60 every seven seconds. These statistics verify the projection that half the U.S. population will be older than 65
Aging takes its toll on the visual system in a number of ways. Vision experts agree less light reaches the back of aging eyes, pupils get smaller and the lenses thicken, absorbing more light. In addition, aging eyes lose their ability to distinguish the contrast and sharpness of images and vividness of colors. Decreased vision contributes to falls or other accidents. Good lighting can help prevent potentially life-threatening injuries.

Older adults lose peripheral vision, causing their visual world to narrow. Their reaction time slows to enable the occipital cortex to interpret what is seen. They lose night vision and also may develop cataracts that cause blurriness. Some develop macular degeneration (common with diabetes), causing loss of central vision.

Loss of sensation to the lower extremities is another aging problem, according to Cris Rowan, an occupational therapist in Sechelt, British Columbia.

"Peripheral neuropathy causes seniors to rely more heavily on vision for mobility, because often they aren’t able to ‘feel’ their feet. All these factors contribute to increased risk of falls," Rowan said.

In addition, a delayed adaptation from light to dark is a challenge for seniors. Their eyes adapt slowly to different lighting levels, making them susceptible to falls in halls, entrances and stairs. Glare from poorly shaded lighting sources, reflective surfaces and large building apertures can cause acute discomfort.

Rowan recommends these home lighting modifications:

- **Path lighting**—Install wall mounts 2 feet above the floor in paths frequented at night, such as between the bed and bathroom and between the bedroom and kitchen, to improve nighttime vision. Older adults usually don’t want to wake their spouse by turning on overhead lighting at night.
- **Task lighting**—Use overhead pot lamps or under-counter mounts. Install in the kitchen, bathroom (over toilet, sink), den desk, laundry and the garage work bench.
- **Stair lighting**—Direct overhead and/or side mounts 2 feet above floor level to illuminate stairs (the most frequent area for falls).
- **Natural light**—Because natural light has no glare, optimize vision with windows in areas as much as possible.

Rowan recommends a “new age” lighting product called Ott-lite, an HD frequency that illuminates without the glare. See www.Ott-Lite.com.

An excellent older adult lighting resource is ANSI-approved RP-28-07, Lighting and the Visual Environment for Senior Living, from the Illuminating Engineering Society. The publication is loaded with technical information and practical indoor/outdoor lighting solutions for private homes as well as commercial and institutional settings, such as assisted living facilities. (Visit www.ies.org and select “bookstore.”)

The IES book devotes 20 pages to area-specific lighting solutions. For example, a color photo demonstrates how rope stair lighting one foot above the stair tread is controlled by a motion sensor. Decorative molding above the rope directs the light down, away from residents’ eyes.

### Decreased vision contributes to falls that too often result in long-term disability.

**Good lighting can help prevent potentially life-threatening falls.**

### Newer lighting technology

Studies have shown a 65-year-old may need up to 15 times as much light to read as a 10-year-old. A visually impaired person may need three times as much light to read as someone the same age who is not visually impaired. In most cases, brighter is better.

Light-emitting diodes (LEDs) in illuminated magnifiers are invaluable for people with visual impairments, said Bryan Gerritsen, a lighting consultant for the American Foundation for the Blind, Center on Vision Loss, Dallas.

“Diodes of various colors and intensity have been used in the past, but most recently, chips and multichips are utilized with these illuminated magnifiers,” Gerritsen said.

Older adults need more choices of LED desk lamps and easy chair lights, Gerritsen said.

“LED table lamps are becoming available in some stores and Web sites. More are needed. Floor lamps should be positioned next to the older person’s easy chair, couch or bed to provide task lighting while reading or sewing,” Gerritsen said.

Gerritsen said yellow LEDs’ high contrast and minimal glare have proven effective. However, bright white LEDs have been the best choice for many of his clients. A design providing a wide fan or spread of light is still best.

### Standards needed

Lighting standards already exist for performing tasks such as reading, threading a needle, cooking and grooming. However, older adults—and others with vision problems, such as macular degeneration, diabetic retinopathy, glaucoma or cataracts—
need much more light than the standards currently call for. This has strong implications when planning to light kitchens, bathrooms, clothes closets, entrances and stairways. Gerritsen advised adding extra lighting in cabinets where dishes are stored, near doorways to illuminate the key lock, and possibly near electrical outlets to assist in inserting plugs.

**Older adult lighting concerns**

“Full spectrum” or daylight lamps have become increasingly popular in recent years. Yet some research has shown “blue light,” generally present in these lamps over 5,000 Kelvin, may be linked to macular degeneration, the most common cause of vision loss in the Western hemisphere, Gerritsen said.

“Therefore, there are concerns about using full spectrum lamps as a floor lamp or desk lamp for long-term reading, crocheting, and task illumination. Other options are likely needed, including more LED lamps and incandescent lamps,” he said.

The Eskaton National Demonstration Home (www.eskaton.org) in Roseville, Calif., which showcases Universal Design aging-in-place principles, uses LED and compact fluorescent lamp (CFL) lighting throughout. California Lighting Technology Center (CLTC) specified the demo home’s senior-friendly lighting. A University of California, Davis affiliate, CLTC works with manufacturers to take lighting ideas from concept to the marketplace.

According to Kelly Cunningham, outreach coordinator at CLTC, dark-adjusted older eyes take 20 minutes to readjust after being exposed to sudden light, and this time increases with age. Seniors also get up more frequently to use the bathroom at night, meaning whether the lights are on or off, they need to be able to see sufficiently.

“A 2-watt LED can provide enough light to reach the toilet without turning the main light to full brightness,” Cunningham said.

The demo house uses a motion-sensing carriage light with a CFL bulb and an LED downlight, according to Eskaton’s Kathy Hatten. Besides conserving energy, the carriage light incorporates a safety feature.

“The downlight’s photo sensor automatically turns it on after dark. An occupancy sensor activates the main lamp when motion is detected. When that bulb burns out, the LED downlight remains lit, enabling the homeowner to safely see in the dark,” Hatten said.

Hatten said demo house visitors are impressed with the aesthetically pleasing Smart Vanity lighting fixture, a prototype developed by CLTC.

“The LED downlight turns on when it senses motion, using a soft ambient light that will not cause the blinding sensation of sudden exposure to bright light,” Hatten said. “The main light turns on slowly and gradually increases the light level. Aging eyes are much more sensitive to sudden changes in lighting levels, making this fixture both senior friendly, as well as energy efficient due to occupancy sensor, LED and CFL high-efficiency bulbs.”

**Bathroom lighting considerations**

Because people remove their glasses while showering, sufficient bathroom lighting is critical. Shower/bath lights should not be obscured by the shower curtain or steam. Consider dimmers for main bathroom lighting. Low nighttime bathroom light levels mean aging eyes do not have to readjust to a dark bedroom.

In bedrooms and baths, illuminated light switches with warm-colored nightlights low on the walls are an effective nocturnal path-finding solution. Rope lighting controlled by a switch or motion sensor is another low-level night-lighting option for senior bathrooms. Swash bidet toilet seats from Brondell (www.brondell.com) have four blue LED nightlights to illuminate bathrooms with a soft glow.

For baths without windows or skylights, general lighting controls can be placed outside the door to avoid entering an otherwise dark space.

Daylight can be balanced with ambient light from dimmable hanging fluorescent ceiling fixtures that bounce light off the ceiling and downward. Many seniors are adding skylights to increase daytime lighting, especially in closets and bathrooms.

Eliminating glare is critical for those with low vision. Reposition television sets, so sunlight or lamplight does not shine directly on them. Cover windows with shades or miniblinds, so light can be adjusted during the course of the day. Look for low-glare and natural daylight light bulbs.

Marina Gross Figureiro, Ph.D., professor at the Lighting Research Center at Rensselaer Polytechnic Institute, Troy, N.Y., offered these older adult lighting tips:

- Avoid clear glass luminaires.
- Identify where visual tasks (reading, cooking, sewing, office work) will be performed, and put extra lighting in those areas.
- Use switches/dimmers for residents to adjust lighting levels.

As they move through their life cycles, assertive baby boomers have made a tremendous impact on the U.S. economy. They likely will demand better lighting in their own homes, assisted living and nursing care facilities. You can bet lighting designers and manufacturers are preparing for this aging tidal wave.

Will electrical contractors be ready, as well? W O O D S writes for many consumer and trade publications. She can be reached at patwoods123@hotmail.com.