
Older Americans

REPORT

SPECIAL REPORT: THE DUAL FUNCTION OF LIGHT

Recognizing that vision loss is part of the aging process, an assisted living facility in Arlington, Va., has redecorated several units in bolder colors and equipped them with vision aids as part of a special marketing strategy. But vision is not the eye's only function. In this Special Report, OAR highlights an assisted living facility in Hillsboro, Ore., that has installed skylights to bring illumination levels much closer to daylight and see how that affects the health of residents and workers. Meanwhile, CMS will soon send out a request for comment on possible revisions to its lighting standard for nursing homes. As these trends converge, look for nursing homes and other long-term care facilities to become less dainty (floral patterns are out, solids are in and blending-in is a no-no). At the same time, expect to see a lot more light as the eye's other function — literally, a sixth sense — becomes more widely appreciated.

Assisted Living Chain Targets Needs Of Residents with Limited Vision

Employing a variety of low-tech devices and high-tech gadgets, combined with a fresh eye to what makes something visible and not just visually attractive, an assisted living facility in Arlington, Va., is selling itself as the place to go for people with limited vision.

Bradford View is a “neighborhood” — a floor, actually — within the 150-bed Brighton Gardens of Arlington, which is part of Sunrise Assisted Living. Since opening in June, the specialized program has recruited five residents who appreciate such simple things as a black threshold between the linoleum floor in the bathroom and the carpet in the rest of the apartment.

Other structural features include solid-color walls, where an intricate wallpaper design could induce a “swimming” sensation; flat-finish blinds, to better control the light coming in; and black-and-silver moldings that define the contours of the shower stall.

Then there are the gadgets, everything from check-writing guides and large-print calendars to talking clocks and key chains (they tell the time too, just by pressing them). There is even (on loan from Pulse Data HumanWare) a closed-circuit television that magnifies things in white-on-black, black-on-white, black-on-purple and several other options.

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Light Deprivation Should Not Be Price Of Safety for People with Alzheimer's

Family members and aging service providers often keep people with Alzheimer's indoors to keep them from wandering.

In doing so, however, these caregivers may be withholding something that not only enhances their loved ones' moods but helps them sleep soundly, according to Eunice Noell-Waggoner, president of the Center of Design for an Aging Society in Portland, Ore.

Noell-Waggoner said she got her first inkling about the relationship between daylight and the brain when she was a college student in cloudy Eugene, Ore., and spent most of the day in the same building.

“I'm eager, just ready to go, but yet I could not retain information, so I was flunking out of school,” she told *OAR*. But in the spring, she signed up for an archery class that met at 7 a.m. — outdoors, of course — and watched her grade point average rise from 1.8 to 3.5.

“When you're in a depressed mode, ... your memory doesn't etch deep enough. ... My question is: By depriving older people of the exposure to daylight, is their memory impairment made worse? That's the kind of question I ask, just trying to get people to think.”

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Low-Vision Unit *(Cont. from previous page)*

It is all part of an effort to make the most of the vision people have, so they can pick up old hobbies, keep in touch with the news and in general maintain their intellectual functioning. In fact, many of the innovations for low-vision people are useful on the dementia unit as well.

But the most important thing is nothing new, according to Executive Director Heather Rucker. Rather, it is central to Sunrise's corporate philosophy and the very idea of assisted living, which CEO Paul Klaassen and his wife Terry helped pioneer two decades ago. Simply put: Help people help themselves, rather than take over and start doing things for them.

"Don't do it for them, even if it takes 30 minutes longer than it would take to do it for yourself," Rucker instructs her staff, she told *OAR*. In fact, Rucker has had to relearn this concept herself.

Taking the hand of Meghan Wedd, director of community relation, Rucker demonstrated what she used to think her job was: to literally lead someone, walking in front, pulling the person behind.

All wrong, Rucker said. "Let them lead you," she said, as she switched her grip and took Wedd's upper arm from behind, so that Wedd was now a couple inches in front of her. And don't ever open doors for them, Rucker added.

Finding Wider Applications

Although much of what one sees in Bradford View is innovative, some of the techniques are so glaringly obvious — making the stop button on a tape recorder red, and the play button green, for example — that one wonders why they aren't in universal use.

In fact, Rucker and her colleagues are gradually extending some of the principles they have employed in Bradford View to the entire building. In the dining room, for example, table cloths are a solid, dark color, so white plates do not blend into the background.

Likewise, the potatoes get a garnish to keep them from blending into the plates. And next year, perhaps, the dining room carpet, a floral pattern on a blue background that could lead someone with low vision to think it was somehow three-dimensional, has to go.

Piece by piece, the low-vision strategy holds the potential of reversing the effects of a decline in vision, if not in the vision itself. Thus, to sit with someone who for the first time in a long time can distinguish an "a" from an "e," thanks to a magnifying machine, is "amazing," Rucker says, like watching a child learn to read.

"It's a real shift in the world of assisted living. I think it's going to change the way we create our communities, I really do."

Getting Outside *(Cont. from previous page)*

In Oregon, where fall and winter can be cloudy, Noell-Waggoner's experience could be described as a case of Seasonal Affective Disorder. But the mechanism by which a low-light environment can lead to a mental dragging of the heels has nothing to do with the time of year.

Instead, it illustrates what can happen to anyone who does not get outside or have enough windows. And no group is more at risk on that score than people in nursing homes.

Noell-Waggoner cites a study by Sonia Ancoli-Israel, a professor of psychiatry at the University of California, San Diego, in which 55 nursing home patients with severe dementia got a mean of only one minute per day of bright light, defined as 1,000 lux — the kind of light it is hard to get without going outside.

The study found that people who got more light during the day slept better at night, and a good night's sleep is worth a lot, both to people with Alzheimer's and to those who care for them. In fact, the turning point for many family members comes when their own health starts to erode because spouses or loved ones are keeping them up, Noell Waggoner says.

Ancoli-Israel says brighter environments do not make people inherently brighter, however, just as Noell-Waggoner did not become smarter when she started her archery class. "I don't know of any data to suggest that cognitive function, per se, is affected by the amount of light exposure," Ancoli-Israel told *OAR*.

That being said, Ancoli-Israel recommends that nursing homes make their places brighter and get residents outside. But the latter strategy is not always practical: staff may not have time; residents may not be inclined to go out, especially if the weather is not nice; and there may not be a good space outdoors to take people.

Scientists Take Seriously What They Once Pooh-Poohed on Light, Health

Thomas Jefferson University neuroscientist George Brainard, who helped identify special cells in the eye that have nothing to do with vision, believes the tide has turned among his peers in terms of taking such research seriously.

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Scientific Attitudes *(Cont. from previous page)*

In 1973, photographer John Ott was ridiculed when he published *Health and Light: The Effects of Natural and Artificial Light on Man and Other Living Things*. But last week, Brainard, who knew Ott and considered him a pioneer, gave the keynote address at a meeting of the Illuminating Engineering Society of North America.

“They’re not fighting, now,” he told *OAR*. “Now, it’s an entire community of scientists.”

Traditionally, there are four criteria for judging light: Is it sufficient to accomplish some task? Is it comfortable, i.e. neither glaring nor distracting? Is it aesthetically pleasing? And does it use a minimum of energy?

Those remain good criteria, Brainard said, “but now we’ve got this remarkable new discovery, the human eye has this distinct sensory system.” Nor should it be shocking to discover the eye serves two functions. After all, everyone accepts that ears serve both for hearing and balance, and the one has nothing to do with the other.

The problem, ironically, is that the eye is too good at vision: It can see things in remarkably poor conditions. “In contrast, light which affects us biologically tends to take an awful lot more,” Brainard says. “You need more, and you need more in the blue part of the spectrum,” the color to which people are tuned by the sky.

By the same token, the eyes need a negative — the absence of light — at night. “It’s probably healthy to always sleep in the dark. ... We evolved under generations of having relatively dark nights” where the only light was moonlight, starlight and firelight — all very low, and shifted toward the red end of the spectrum.

Link to Breast Cancer at Issue

In fact, there is evidence that too much light at night suppresses the production of a hormone called melatonin, and that this in turn can lead to breast cancer because melatonin has an oncostatic, i.e., cancer-inhibiting effect.

Brainard says higher rates of breast cancer have been found among women who work at night or in airplanes, where they are pulled across time zones. Meanwhile, blind women have lower breast cancer rates.

The apparent link “does not warrant panicking,” Brainard says. “I am not sure that nighttime light exposure causes breast cancer yet, but I think it’s an

important topic to watch.” Meanwhile, nursing homes should take care not to introduce bright light when residents are asleep.

“A nurse comes in to examine you — boom! The light comes on. ... Staff might need to find a way to come in and tend to you ... under the dimmest light possible.”

Alzheimer’s Facility Installs Skylights To Test Effect of Daylight on Health

People with Alzheimer’s disease often take drugs to treat anxiety, depression or an inability to sleep. But at Rosewood Specialty Care for the Memory Impaired in Hillsboro, Ore., where overcast winters are long, a new technique is about to be tested: natural light.

In February, the 48-bed facility installed four six-panel skylights in one of its two wings. Meanwhile, a computer turns a set of supplementary lights on or off to keep light in the common area at 250 footcandles.

That is a far cry from the 6,000 to 10,000 footcandles produced by direct sunlight, but is much more than typical office lighting, which is generally 35-50 footcandles.

Next week, researchers will start trying to gauge the effect of the system on residents’ and workers’ moods and sleep patterns. But already, the brighter light has encouraged at least two women who used to stay in their rooms to venture out, according to Administrator Jennifer Edimon.

“They’re just becoming more of the community” and have started going on van rides, she told *OAR*. Residents also like listening to the rain as it falls on the glass, and have commented on how bright it is. Staff are happier too.

“I personally like the light, in general,” Edimon said. “I like to be out in the sun. It kind of just does something for me.”

Light Has More Than One Purpose

In fact, scientists are learning a lot about what light does for people, and how people’s requirements for light change over time. As people age, their pupils become smaller and less responsive to changes in light levels.

Meanwhile, the lens becomes thicker and slightly amber, making it harder to focus and notice contrasts. As a result, 60-year-olds require more light
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Skylights (Cont. from previous page)

to see — in half the cases, two-and-a-half times more than 20-year-olds, according to research published in 1971. But the loss of visual acuity is not the only problem, because light, especially unfiltered daylight, serves functions that have nothing to do with vision.

This includes helping the body make vitamin D, which in turn keeps bones strong. It also includes setting the biological clock, the one that distinguishes night from day.

Seniors often have trouble sleeping, as these internal clocks become irregular. And insomnia can create a host of problems, including poor balance and compromised immune systems (*OAR*, March 19, p. 87). But poor sleep cannot be attacked only at night: The solution also depends on having a full-fledged experience of daytime.

That is where the typical nursing home falls short, says Philip Sloane, professor of family medicine at the University of North Carolina at Chapel Hill and director of the Rosewood study along with Karen Telerico and Susan Hickman from Oregon Health & Science University.

The average nursing home resident spends almost no time outdoors, which means many spend none at all. That is just asking for trouble, Sloane told *OAR*. “We do know that you need a lot more exposure than that to prevent depression and to reset the body’s clock.”

Asking a Question

In a proposal to the Energy Trust of Oregon, which provided \$106,000 in rebates to help remodel the Rosewood facility, Sloane said it is not known whether light therapy can help people with Alzheimer’s, but it is worth finding out.

“Elderly persons, particularly those in nursing homes, have little or no exposure to sunlight, due to limited mobility or lack of access to the outdoors. ... With their high prevalence of sleep disturbances, depression and agitation ... nursing home and assisted living residents would be ideal candidates for high-intensity light therapy.”

Ironically, the Rosewood facility was designed with skylights, according to Eunice Noell-Waggoner, president of the Center of Design for an Aging Society in Portland, Ore., and a consultant on the Rosewood project. But at the last minute, apparently to save a few dollars, the building contractor left them out.

Now people ooh and aah at what has been done, Edimon said. “Family members actually love it ...

They think it’s great — it’s nice, it’s bright, it’s cheery. ... When people come in on tour, they’re just amazed at how bright it is.”

The Bible on Aging and Light

Lighting and the Visual Environment for Senior Living (RP-28), published by the Illuminating Engineering Society of North America, is a comprehensive treatment of lighting for seniors and has been adopted by some states.

It discusses how to compensate for pre-retinal scatter; how to accommodate people with retinal dysfunction and how to deal with disability glare. Sections cover how to light stairs and elevators, congregate dining areas and libraries — even ping pong tables and music stands.

A chapter on “Daylighting for Senior Housing” provides diagrams of various window and skylight arrangements, and color photos illustrate solutions to numerous problems, such as how to use indirect lighting in a low-ceiling corridor and how to use dormer windows without destroying the balance of indoor and outdoor light.

Copies are \$40 and may be purchased by contacting Albert Suen at asuen@iesna.org or by visiting the society’s Web site, www.iesna.org.

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