

■ **Operations**  
Skilled nursing's changing  
business model 20

■ **Management**  
Five critical points you need  
to know about ACOs 29

■ **Finance**  
GSEs hit speed  
limit 34

■ **Company Profile**  
MorningStar is on a mission  
in Mountain States 52

# SENIORS HOUSING BUSINESS®

*The Magazine for Seniors Housing Real Estate and Operations*

April / May 2015

# CCRCs on the rise

26



■ **SHB**  
Interview  
**Katy  
Fike**  
finds her  
calling with  
Aging2.0  
58

# Technology Lighting the way to better health

*New technology enhances residents' moods, reduces costs and improves outcomes*

By Eric Taub

**Lighting is no longer** just for light.

Thanks to new technology, today lighting is being used not only to illuminate, but also to rejuvenate. Healthcare facilities are finding that proper lighting enhances sleep, decreases agitation, cuts down hospital stays and improves overall healthcare outcomes.

The key to making light a reliable therapeutic tool is the advent of LED, or light-emitting diode, technology. Rapidly replacing standard incandescent and fluorescent lamps, LED lighting has multiple advantages over its old-time competitors.

Those improvements include much lower energy consumption (as little as one-tenth the electricity used by an incandescent lamp), a usable lifetime measured in decades rather than months, and the ability to alter colors, saturation and brightness within the bulb itself.

## Today's lighting often substandard

Traditionally, assisted living facilities and other healthcare institutions have used standard and compact fluorescents to illuminate hallways and rooms. While they provide a large amount of light and use less power than incandescent lamps, fluorescents have a number of drawbacks.

The light that fluorescents produce is "discontinuous." That is, it contains colors in only some parts of the spectrum. That's why photographs taken under fluorescent light often look green. Fluorescents flicker; while often not perceivable, the flicker can increase with age, and cause drowsiness, according to John Casadonte, product marketing manager for Cree, a lighting manufacturer based in Durham, N.C. The ballast in the fixture can also produce an ever-louder, annoying hum. Fluorescent lamps also contain mercury, a pollutant.

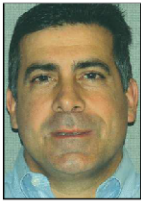
In addition, the color emitted by fluorescent lamps changes with age. Walk down an assisted living hallway in a facility that's not well maintained, and you're likely to see a mélange of hues of varying brightnesses bouncing off the walls.

## Advantages of LEDs

In contrast, LED lamps contain no mercury. They use even less power than fluo-

**At ZIS, a pain center in Munich, a variety of lighting fixtures replicate the phases of the day.** In the top picture, bright, blue light is used to imitate natural daylight. In the bottom picture, warm colors and less than 10 percent of the luminance imitates evening. The use of the two settings at different times of day supports the sleep/wake rhythm of residents, which helps alleviate depression and sleep problems.





**"Healthcare facilities are improperly lit. They use whatever lamps are available,"** says John Casadonte, product marketing manager, Cree.

rescents and are dimmable. As they have no ballast, they produce no hum. LED lamps now come in a wide variety of shapes and sizes, and can be inserted into standard "Edison," or screw-thread lamp sockets.

In normal use — around three to five hours per day — LED lamps will last up to 25 years. After that, they don't suddenly burn out as do standard light bulbs, but simply dim in intensity.

Because they last so long, assisted living facilities will not need to employ individuals to change bulbs, freeing up personnel to tend to other tasks.

As a new technology, LED lamps not surprisingly do have a higher upfront cost. Depending on the type and number of lamps replaced, the savings in energy consumption often allows for a payback period of about two years.

LED lamps can also be made to change colors and intensity. Lamps can produce cold, bluish light, and then switch to warm, yellowish hues. Lamps can also produce virtually every color in the spectrum. And, because LED lamps use digital technology, they can be controlled via a smartphone app, via the Internet from any distance, directed when to turn on and off and what color to produce.

The Internet can also be used to monitor LED lamps, alerting operators as to when the fixtures are malfunctioning or burned out.

The capabilities of LED mesh well with recent understandings of how light can affect one's mood and well-being. "Proper lighting improves the circadian rhythms that affect sleep," says Catherine Rose, a Philips healthcare executive based in Burlington, Mass. "It helps set the biological clock."

As researchers now know, more blue light emanating from a lamp encourages wakefulness, while more yellow light promotes sleep. Since LED lamps have the ability to shift their pallet of hues from one to the other, they are an ideal tool to help improve outcomes.

In a study conducted at the Lighting Research Institute at Rensselaer Polytechnic Institute in Troy, N.Y., altering the color hues during the day and evening for Alzheimer's patients increased sleep and restfulness, and decreased evening agitation rates.

But improved lighting helps more than those with degenerative diseases. We all can benefit from improved sleep. And lighting

**HealWell lighting from Philips uses a variety of illumination colors and brightnesses to support healthy sleep, alleviate anxiety, and lift mood in patients and staff, as shown below in use at Maastricht University Medical Center in the Netherlands. In a study conducted at the Lighting Research Institute at Rensselaer Polytechnic Institute in Troy, N.Y., altering the color hues during the day and evening for Alzheimer's patients increased sleep and restfulness, and decreased evening agitation rates. The top photo shows bright daytime lighting; the middle shows energy-efficient lighting; and the bottom photo shows warm, evening lighting.**





# Blueprint for Your Project Success

## Your Vision is Our Mission

- ✔ Project Feasibility Studies
- ✔ Capital Finance Consulting
- ✔ Due Diligence
- ✔ Outsourced Underwriting

### HUNDREDS of Successful Project Outcomes

- Over \$1 billion in new project development
- 25 years successful experience
- Covering all North America



Call to find out how you can get an extraordinary FREE 80-page report for your development go or no go decision

**Clint Lovell**  
Principal

Rainmaker Underwriting, LLC • Houston, Texas  
281-537-1200 • [www.rainmakerunderwriting.com](http://www.rainmakerunderwriting.com)

can also enhance a room's "ambient experience," Philips' Rose notes, improving one's mood, and helping calm people prior to a physical examination.

Hue, a product from Philips, enables users to alter the color of light output from Hue's included LED lamps. Using the Hue smartphone app, users can download light "recipes" developed by third parties that instruct the lamps to output more blue light in the morning, and more yellow light at the end of the day.

"Healthcare facilities are improperly lit," says Casadonte of Cree. "They use whatever lamps are available; often they're the lowest-cost products that have no consistency of color." The result is often hallways with spotty light, differing colors and lamps that are burned out.

"When that happens, as a resident or adult caregiver, you lose confidence that things are working properly," says Casadonte. And if a facility is perceived as being poorly maintained, it can cost sales.

#### New lamps, or new paint?

The lamps in the hallways of Colorado's Longmont Housing Authority buildings were so bad that residents thought that the brown spots in the fixtures were actually bugs. Hallway walls were splotchy and yellow because the light was uneven.

When Terralux, an LED manufacturer, replaced them with LEDs, "one senior resident thought we had repainted the hallway, but we had just changed the bulbs," says Matthew Sallee, director of strategic marketing for Terralux, based in Longmont, Colo.

In a lighting trial conducted in a German dementia facility by Osram Sylvania, LED lighting that offered more blue light during the day improved sleep cycles and patient communication capabilities, notes Dr. Andreas Wojtysiak, the company's senior key expert for light and health.

In another Osram study, at a Berlin psychiatric clinic, high light levels reduced hospital stays from an average of 25 days to 22. When Cree installed LED



"One senior resident thought we had repainted the hallway, but we had just changed the bulbs," says Matthew Sallee, director of strategic marketing, Terralux.



"The budgets for facility construction and medicine are separate, and they're not easy to combine," says Dr. Andreas Wojtysiak, senior key expert for light and health, Osram Sylvania.

lighting in the entrance and halls of the famed Cleveland Clinic, patient surveys indicated that they felt better as soon as they entered. "Patients said they felt peppier and more vibrant," says Casadonte.

These observations are reinforced by "The Impact of Light on Outcomes in Healthcare Settings," a major study on the effect of lighting on health conducted by Anjali Joseph, director of research for the non-profit Center for Health Design, based in Concord, Calif.

According to the report, "light impacts outcomes in healthcare settings by reducing depression among patients, decreasing length of stay in hospitals, improving sleep and circadian rhythm, lessening agitation among dementia patients, easing pain, and improving adjustment to night-shift work among staff."

The proper color of light not only can improve restfulness, but it also can improve diagnosis. Just as a steak won't look appetizing when viewed under fluorescent light, neither will a resident look as healthy as they might be when viewed under improper lighting conditions, such as lamps producing artificial, cold tones.

A well-illuminated room also helps staff to stay alert and be able to perform various caregiving procedures with fewer mistakes, simply because they'll be able to see well. As the study notes, "the amount, spectrum, and distribution of the light determines the level of performance that is achieved."

Performance level is particularly important for assisted living caregivers. Charting errors, or mistakes made in administering or chronicling medications could have major consequences, creating a situation where "inadequate lighting and a chaotic environment are likely to compound the burden of stress and lead to errors."

Performance level is particularly important for assisted living caregivers. Charting errors, or mistakes made in administering or chronicling medications could have major consequences, creating a situation where "inadequate lighting and a chaotic environment are likely to compound the burden of stress and lead to errors."

#### LEDs open new technological path

As a digital technology, LED lamps also offer an ideal way to easily incorporate sensor technol-

**At the Raleigh Orthopaedic Clinic in Raleigh, N.C., Cree retrofitted the entire facility with LED fixtures.** The new lighting has reduced energy consumption by 54 percent, and is expected to save more than \$280,000 over the lamps' 10-year life. The fixtures in the surgical rooms can be dimmed during patient recovery, or brightened when physicians discuss test results. They also do not collect dust, cutting maintenance costs.



### About the writer

**Eric Taub** is a co-founder of 602Care, workflow software for the assisted living industry. He is also a freelance writer, covering healthcare and technology for more than 20 years for *The New York Times* and other publications.



ogy in residents' rooms, given that lamps are ubiquitous and run on the same voltage as do environmental sensors.

"We want to make lighting more relevant," says Sallee of Terralux.

Sensors attached to LED lamps can monitor a room's environmental conditions such as air quality and temperature.

RFID tags worn by caregivers can be detected through a receiver mounted in the lamp, giving accurate information as to the frequency of caregiver visits and time spent with a resident, as well as tracking response times to a resident's call button.

#### Despite benefits, industry drags its feet

Given the clear benefits afforded by advanced LED lighting, why are institutions seemingly so slow to change?

Inertia is one reason. "There's a disconnect between resident experiences and an institution when it's in the planning process," says Philips' Rose. "A facility may say, 'Our lighting was fine for the third floor, let's do the same for our new fourth floor.'"

In addition, new lighting technologies do not have a direct effect on the bottom line, and with healthcare facilities under financial pressure, the product with the least-expensive upfront cost is often the one that will be used.

"The budgets for facility construction and medicine are separate, and they're not easy to combine," notes Wojtysiak of Osram.

That said, the world's lighting manufacturers are eager to work with the assisted living industry to prove that their technology works in improving outcomes.

"We'd love to partner with places that want to improve the experience of people getting care," says Philips' Rose. "Technology is no longer limiting our capabilities." ■

**earthwerks**  
FLOORING INSPIRED BY NATURE

**WE ARE LVT TRIED & TRUE**  
STYLE SERVICE AVAILABILITY

**TRIED & TRUE - FEELS LIKE HOME. WEARS LIKE IRON.**

Warm and inviting for them – durable for you. Performance at both levels is what makes EarthWerks® LVT different. With over three decades of innovative designs and manufacturing technology, we're pioneers in LVT fashion flooring for a variety of demanding environments.

Flooring that can take traffic and make turnarounds easy.

That's LVT experience you can trust. EarthWerks®, tried and true.

**SOME OFFER LVT – WE ARE LVT™**

For information regarding our extensive line of sustainable vinyl flooring, please call 800-275-7943 or visit us online at [www.earthwerks.com](http://www.earthwerks.com)