



A HEALTHY GLOW

The Impact of Better Light on Healthcare Facilities

As healthcare administrators grapple with a growing emphasis on delivering a better patient experience, they may be overlooking one of their most powerful tools: **the lighting within and around their facilities.**

There's a growing body of research that the right lighting will not only generate maximum energy savings but also help improve patient satisfaction, staff productivity and morale, overall safety and security, and brand appeal.



OVERVIEW

In the Fall of 2016, the Department of Energy sponsored a series of webinars on healthcare lighting that underscored an often-neglected truth: lighting's impact on humans is profound.

As researchers around the world investigate the influence of lighting on human health and healthcare, they're finding that better lighting has the power to significantly benefit patients and staff alike. This new understanding of light's impact on human health, productivity and well-being comes at a time when two other developments make these findings relevant and actionable:

- **Healthcare system administrators** cite the goal of delivering an improved patient experience as a top priority, and many are looking to modernize or repurpose existing facilities in pursuit of this aim.
- **Rapid advances in LED lighting technology and applications** make possible the application of such research in cost-effective, practical ways that would have been prohibitively expensive or impractical only a decade ago.

Still, healthcare system executives are wise to be cautious: LED lighting solutions run the gamut in their degree of energy efficiency, light quality, technological sophistication, flexibility and ease of use. Realizing the substantial and sweeping benefits of better light requires a thoughtful and systematic approach to a lighting upgrade.

This paper examines the myriad benefits of better lighting and how to achieve them for a healthcare facility.

IN PURSUIT OF A BETTER PATIENT EXPERIENCE

Enhancing the patient experience is a primary goal for today's healthcare systems and providers.

In an authoritative 2016 survey of hospital executives, 80 percent of hospital CEOs said that by 2021, they expect patients will comparison shop the patient experience rating of hospitals before choosing a provider,¹ and 84% said they expect that at least 10% of hospital reimbursement will depend on HCAHPS scores by that same year (see Sidebar: More About HCAHPS).² It's no surprise then, that hospital executives now rank patient satisfaction, patient safety and quality of care among their top five priorities.³

Improving patient outcomes is an essential part of this, but it's just the beginning. Every aspect of the patient's and family's encounter with a healthcare provider — especially the degree of safety, security, consideration and comfort experienced — contributes to the patient's experience. A 2016 report by the American Hospital Association and ASHE points out that "the patient's experience of care is influenced by valuable and often underused resources: the health care physical environment and the people who manage it."⁴



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MORE ABOUT HCAHPS

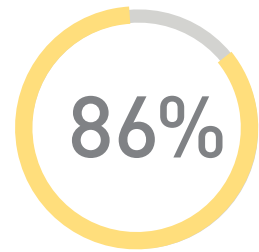
Healthcare providers and systems have historically focused on tracking and improving patient outcomes and satisfaction. But now that the Centers for Medicare & Medicaid Services (CMS) is tying reimbursements to HCAHPS scores, providers are also closely examining how well they deliver a total patient experience against broader service quality items important to consumers.



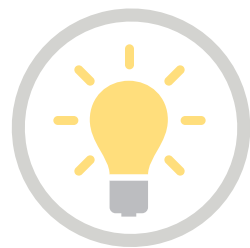
HCAHPS stands for the Hospital Consumer Assessment of Healthcare Providers and Systems survey. It's a standardized survey distribution and data collection methodology for measuring patients' perspectives on their care across 27 categories, ranging from how well doctors and nurses communicate to facility cleanliness and quietness. HCAHPS scores provide a national and transparent standard to enhance public accountability in healthcare and to help consumers make valid and meaningful comparisons across hospitals.

Hospitals scoring poorly can take a double hit: not only can informed consumers choose alternative providers with higher scores, but as of 2017, CMS can withhold up to 2% of a provider's reimbursement dollars for a low score, creating strong incentives for hospitals to improve their ranking.

LED LIGHTING AND HEALTHCARE



of survey respondents said that patient satisfaction is “very important” in driving design changes to health facilities and/or services.



Lighting figured prominently among the top ten features being implemented to improve patient experience.

This pronounced emphasis on delivering a better patient experience emerged just as healthcare systems started looking for ways to modernize, upgrade or repurpose existing facilities to make the most of what they already have, and to maximize the return on new construction.

In a 2015 poll of hospital administrators, “nearly 67 percent of survey respondents said they are either repurposing health care facilities or currently assessing space for other needs.”⁵

The 2016 poll was even more telling in how the rise of healthcare consumerism is impacting their renovation and new construction:

- More than 86 percent of survey respondents said that patient satisfaction is “very important” in driving design changes to health facilities and/or services, 12 percent said it was “somewhat important,” and 63 percent said they include patients and the public in the design process.⁶
- While 70 percent of respondents said they have projects currently under way or planned within three years, a full three-fourths of these were expansions or renovations, not new construction.⁷
- Lighting figured prominently among the top ten features being implemented to improve patient experience: 51 percent were including individual room controls of systems such as lighting, window shades and temperature, and 49 percent were including specialty lighting for added comfort and safety.⁸

Since Cree created the first commercially viable LED lighting fixtures in 2007, LED lighting technologies have rapidly become the default choice for new lighting and upgrades. The energy savings, rapid ROI, better light quality and low maintenance have made LED lighting in healthcare facilities a “no-brainer.” Knowing that, many buyers jump right in to evaluating manufacturers and fixtures. After all, LED lighting is LED lighting — or is it?

Ten years ago, the same thinking might have applied to mobile communications: a cell phone is a cell phone. All that changed in 2007 when Apple and other manufacturers introduced the first smartphones: suddenly a cell phone could deliver a universe of functionality, productivity and information.

Many of the most profound and exciting benefits to healthcare promised by lighting technology require a technological and engineering sophistication and light quality above that offered by generic LEDs.

First, let’s look at exactly what those potential benefits are.

THE HUMAN FACTORS

Smarter lighting solutions offer greater potential to immediately improve patient experiences, staff productivity, overall safety and security — and can easily adapt as more evidence-based lighting applications for healthcare emerge.

Lighting is ubiquitous: people work, play and live in illuminated environments. The potential benefits of better light are almost as universal.

Common sense tells us that our ability to perform tasks improves with our ability to see. In healthcare facilities, many of which operate 24/7, the stakes are especially high — patients, caregivers, family members and non-clinical staff all feel the effects of a facility’s lighting choices, for better or worse.

Some of the worst effects? Glare, hum and flicker, which are all contributors to problems such as eye strain, headaches and eye irritation, as well as to fatigue and attention deficit. In a review of the literature on how lighting affects patient care, the *Journal of Biosciences and Medicines* noted that among the light fixtures studied, only LED lighting has the ability to eliminate these ailments.⁹



More than half the RNs in the U.S. are 50 or older, and at that age, the human eye requires three times the light to see.¹²

After a survey of 252 nurses in 2015, the U.S. Department of Energy (DOE) advised that the recommended light levels for healthcare facilities may be higher than the levels provided by conventional lighting systems.¹⁰ This has become a critical concern as healthcare facilities strive to accommodate an increasingly older nursing workforce.¹¹ More than half the RNs in the U.S. are 50 or older, and at that age, the human eye requires three times the light to see as well as at age 25, takes longer to adjust to changes in light levels, and has greater difficulty distinguishing colors.¹²

A 2016 DOE review of published research in collaboration with Clemson University and Professor Anjali Joseph (Center for Health Design) and Robert Davis and Andrea Wilkerson of Pacific Northwest National Laboratory provided more evidence that improved lighting conditions were essential for high performance of visual tasks and can reduce errors and falls.¹³ (See Sidebar: Profound, Persistent and Positive).

Better light may also improve clinical diagnostic accuracy beyond increased illumination by enhancing the contrast between areas under observation and surrounding tissue, related to a light's color rendering index (CRI). This topic is now receiving further analysis and review as researchers explore the potential impact on diagnoses and treatment decisions.

Yet lighting's visual effects are only part of the story: investigators continue to find evidence that lighting's non-visual effects are equally important. Proper lighting can help lower staff stress and burnout, as well as mitigate a host of problems for patients, such as reducing pain, depression and agitation.¹⁴



For example, lighting can help restore and maintain a natural circadian cycle — the 24-hour metabolic clock that underlies many of the body's most fundamental biological processes. Light enriched with frequencies in the blue spectrum makes us alert during the day but disturbs our sleep at night. The blue wavelengths excite a pigment called melanopsin that resides in the eye's non-visual photoreceptors (known as intrinsically photosensitive retinal ganglion cells or ipRGCs) that send signals to the brain.

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PROFOUND, PERSISTENT AND POSITIVE: RESEARCH FINDINGS SUMMARIZED BY THE DEPARTMENT OF ENERGY¹⁵

Evidence-based lighting impacts on patient well-being and recovery

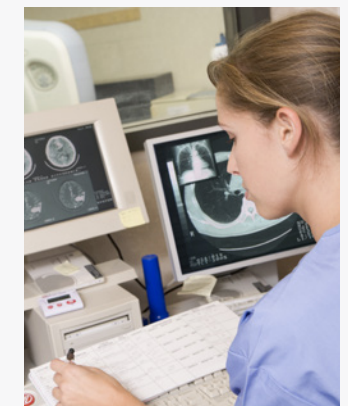
- Spinal cord surgery recovery patients on the brighter side of the unit perceived lower stress and less pain. These patients took 22% less analgesic medication per hour and incurred 21% lower pain medication costs. (Walch et al., 2005)
- There was a significant drop in agitated and disruptive behaviors when Alzheimer's residents were in areas of consistent light levels compared to varying light levels. (LaGarce, 2002)

Evidence-based lighting impacts on clinical task performance

- Dim light conditions during night shifts made patient care and decision-making more difficult. (Nilsson et al., 2009)
- There was an inverse relationship between illuminance levels and eye fatigue in night shift workers. (Azmoon, 2013)
- 87% of nurses believe that providing adequate lighting in the medication room was a contributing factor for task accomplishment. (Mahmood et al., 2012)
- Inadequate lighting has a negative effect on staffs' work performance. (Dianat et al. 2013)
- A 30-minute bright light exposure significantly reduced perception of stress and burnout syndrome. (Kakooei et al., 2009)
- Inadequate illumination of the operating field (32%) was considered as one of the reasons for surgeons' discomfort during operations. (Matern and Koneczny, 2007)
- In OR environments, there was a non-significant inverse relationship between illuminance levels and stress among anesthesiologists and nurses. (Morghen, et al., 2009)

Evidence-based lighting impacts on error reduction and patient safety

- Low light levels contribute to gait instability, gait speed and falls among the elderly, especially for those at risk of falling. (Figueiro, 2011; Kesler, 2005)
- Higher lighting levels were associated with fewer medication dispensing errors in the pharmacy. (Buchanan & Baker, 1991)



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LED lighting has the potential to coordinate artificial light's intensity and spectral makeup (the varying blends of blue, red, green and other wavelengths that combine to form different color temperatures of white light) with the daily patterns of natural light, and there are numerous possible applications in healthcare settings. Researchers have found that sunny hospital rooms accelerate recovery from severe depression,¹⁶ and that bipolar patients exposed to direct sunlight in the morning had hospital stays 3.5 days shorter than patients who were not.¹⁷ Disruption to nurses' circadian rhythms, diminishing their ability to remain alert throughout the night, is also one of the challenges of nighttime nursing.¹⁸

Given the ability to easily adjust the intensity, timing and temperature of its lighting, a healthcare facility could improve staff alertness and performance, alleviate patient sleep problems (especially for the elderly), and even support a patient's mood and well-being to a degree that results in shorter hospital stays.

From reducing medical errors to relieving ICU-induced psychosis (see Sidebar: Banishing the Scourge of Delirium), the capacity to tailor LED lighting systems to meet both visual and non-visual needs within healthcare environments presents almost countless opportunities.

Yet there is potential for poorly engineered LED products or poorly implemented lighting systems to cause harm.¹⁹ With the broad range of human-centric lighting impacts now being widely reported, well-documented and replicated in numerous studies, it will soon be possible to systematically apply this expansive knowledge and create best lighting practices and standards for healthcare providers.

As a pioneer in LED lighting technology innovations, Cree is uniquely positioned to meet even the highest healthcare lighting standards and bring both better light and more intelligent, flexible lighting solutions to healthcare facilities.

Powered by Cree TrueWhite® Technology, Cree® LED fixtures deliver an exclusive combination of industry-leading efficacy, 90+ CRI (color rendering index) and consistent color temperatures. Solutions such as Cree's LED troffers also offer easy dimming functionality to better control visibility in diagnostic and clinical areas, increasing accuracy, reducing errors and relieving staff stress.



BANISHING THE SCOURGE OF DELIRIUM: LIGHTING'S PROMISING ROLE IN ENDING ONE OF ICU'S GREATEST ENEMIES

Delirium, or ICU psychosis, costs the U.S. an estimated \$143 billion a year and exacts a terrible price on patients, families and caregivers. Yet in one study of 338 patients in medical and surgical ICUs, the introduction of an environmental noise and light reduction program reduced the incidence of ICU delirium by 63 percent and the average duration of delirium episodes from 3.4 to 1.2 days.²⁰ In another study, implementing a "sleep promotion bundle" that included light reduction at night and constant light levels during the day cut the 30-day incidence of delirium among ICU patients by more than 47%.²¹

Better lighting may even help hospitals dramatically lower the incidence and duration of one of the greatest patient care challenges they face: delirium, or ICU psychosis. Affecting more than 7 million hospital patients a year,²² particularly the elderly and those in intensive care units, delirium is marked by an abrupt disturbance of consciousness and cognition, delusions, and vivid and often frightening hallucinations.^{23, 24}

The economic costs are stunning: an estimated \$143 billion annually,²⁵ and the human toll is tragic: delirium is associated with increased morbidity, functional decline, more costly and lengthier hospital stays, higher rates of nursing home placement and higher mortality — and the condition may persist for months after discharge.^{26, 27}

Sleep deprivation, disorientation and visual impairment are all important risk factors for ICU delirium,²⁸ and all can be affected by lighting.

Numerous studies have verified that coordinating the lighting in the patient environment to mimic a day-night cycle helps maintain the natural circadian cycle vital to an effective preventive program to forestall delirium,^{29, 30, 31} reduce inflammatory response and promote better patient outcomes.³² Exposure to bright light in the morning hours will even help restore a disrupted circadian rhythm.³³

The introduction of lighting that mimics the natural day-night cycle doesn't go unnoticed by ICU patients. One study that used circadian-appropriate lighting levels found that most critical care patients are aware of the lighting environment. Patients reported that brighter lighting during daylight hours felt pleasant and healthy, and lower light levels at night (dimmer, but not dark) replaced anxiety with calm and engendered a feeling of security.³⁴



A BETTER EXPERIENCE, INSIDE AND OUT

Patients, as well as staff and visitors, are deeply influenced by their perceptions of the entire facility, from the parking deck to hallways, common areas and even the cafeteria — all areas where lighting has a noticeable impact.

In addition to cutting energy costs by as much as 80 percent, an LED upgrade for exterior lighting provides brighter, more reassuring illumination to entrances, courtyards and parking areas — making a facility appear more modern and well-maintained, and increasing its brand appeal. As far back as 2003, researchers reviewing the literature on health care environments and patient outcomes reported that “lighting can play a critical role in the perception of the hospital environment, and ‘the overall effect is far greater in both aesthetic and psychological value when weighed against the cost of other types of architectural improvements’ (Benya, 1989, p. 58).”³⁵

Moreover, facilities with exterior LED lighting are safer for patients, visitors and staff, resulting in lower accident incident reports and higher HCAHPS scores.³⁶ The strategic use of features like daylight sensors adds extra efficiency and savings.

Security is enhanced as well, thanks to the balanced distribution of light that removes dark spaces along building exteriors, pathways and parking lots. Optimal light quality also makes security camera output clearer and makes it easier to read license plate numbers, distinguish the color of vehicles, recognize faces and discern other details. Additionally, the elimination of glare around wall-mounted cameras improves visibility and enhances security for patrol officers.

Sustainability is another key objective of many healthcare providers. Environmentally-friendly lighting solutions such as Cree® area luminaries are made with recyclable materials that do not contain mercury or lead, and the benefits are numerous: a healthier environment, elevated public perceptions and lower operational costs that allow systems to direct more resources to patient care. These benefits can help hospitals meet The Triple Aim — improving population health, improving the patient experience and reducing per capita cost.³⁷



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Inside, better lighting creates an atmosphere that's bright and welcoming, and makes it easier for patients and families to find their way. LED lighting that reduces ceiling "noise" further contributes to creating a calm, healing atmosphere. Dimmable LED lighting is absent the hum typical of fluorescent ballasts and can even help reduce literal noise. Pointing to the negative impact of noisy hospital environments on patient satisfaction scores, Massachusetts General Hospital reports that "Noise is such a stressor for patients that it is proven to be detrimental to their healing process" and notes the importance of controlled lighting levels: "Simply dimming the lights can naturally get staff, patient and visitors to talk more softly."³⁸



LED lighting that can reliably deliver virtually maintenance-free performance will significantly lighten the load on hospital maintenance staff, enabling them to focus on patient-critical problems instead.

An interior LED lighting upgrade also brings added operational benefits, ranging from the efficiency boost of advanced solutions that enable daylight harvesting to simply installing lights that are better recessed to prevent dust from collecting in the fixture. Research shows that patients' perception of cleanliness can be improved with good lighting,³⁹ while providing better lighting makes it easier for maintenance staff to effectively keep facilities clean. In fact, LED lighting that can reliably deliver virtually maintenance-free performance will significantly lighten the load on hospital maintenance staff, enabling them to focus on patient-critical problems instead.

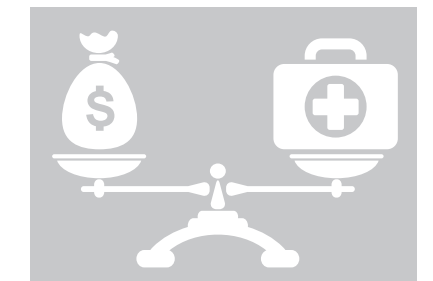
Smart, customizable lighting solutions can furthermore allow patients and families to personalize the environment for their comfort — and make it quick and efficient for facilities to repurpose spaces for clinical or administrative uses.

As HCAHPS scores gain public attention and deliver bottom-line feedback in the form of Medicaid and Medicare reimbursement tiers, the consequences of a healthcare facility's lighting choices matter like never before.

A NEW VALUE PROPOSITION

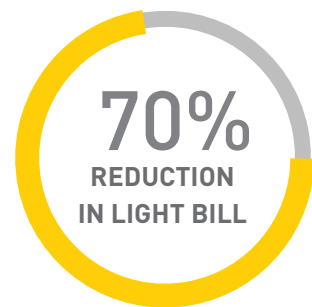
Advanced LED lighting solutions like Cree's TrueWhite®, WaveMax® and SmartCast® Technologies are engineered to achieve and leverage the myriad ways better lighting can positively impact patient experiences and outcomes, enhance staff performance and job satisfaction, and bring more life, security and longevity into a facility, all while creating a more aesthetically pleasing environment.

The business case for investing in more advanced solutions is strong — the costs are now exceedingly affordable, the results help drive increased HCAHPS scores, and the energy savings of LEDs help pay for the improvements. But although energy savings are general to the LED category, actual efficiencies and hidden costs vary widely. Considering the intense financial pressures faced by most healthcare systems, it's imperative that a facility's LED lighting solutions yield maximum energy and cost savings, along with premium rebates.



Even more, with the convergence of trends and technologies beyond healthcare — the Internet of Things, big data and cloud computing, to name a few — investing in the right LED lighting technologies and applications could help facilities cost-effectively tackle complex challenges on the horizon.





LED lighting requires much less wattage and generates much less heat to produce lighting levels comparable to older technologies.

CREE LED FIXTURES USE
20%-30%
LESS ENERGY
THAN INDUSTRY-STANDARD
LED FIXTURES.

MAXIMUM ENERGY SAVINGS, SIMPLY DELIVERED

A lighting upgrade that uses the most advanced LED technology can optimize energy savings AND space utilization without sacrificing quality or customization — and without burdensome costs and complexity.

Energy use is an obvious candidate for controlling healthcare costs. On a per-building basis, the energy use of hospitals and medical facilities far exceeds any other building type, and energy usage intensity (EUI) is nearly three times that of the typical commercial building. A 2012 DOE report said a 50-bed hospital would average about \$13,611 a year in energy costs per bed — and more than 40% of that is lighting.

An LED lighting upgrade can cut this dramatically, with facilities often seeing a 70 percent reduction in their light bill. LEDs are vastly more efficient than fluorescent, incandescent, metal halide, sodium arc and halogen lighting, with a much longer useful life. There are also maintenance savings: the long life and low failure rate of quality LEDs mean virtually no relamping for 10 years or more, cutting labor, inventory storage and lost productivity while lights are serviced — and require no regulated disposal of lamps with toxic materials.

Additionally, many utilities across the country offer substantial rebates on the purchase of LED fixtures and lamps that meet efficiency requirements like those established by the DesignLights Consortium (DLC). In 2016, the DLC updated these requirements, introducing for the first time a tiered QPL (qualified products list) that segments products with improved performance into a DLC Premium tier, and paving the road for even higher rebates for qualifying fixtures. In many cases, these rebates lower the initial cost of high-efficiency fixtures to well below that of inferior LED products.

In warmer climates, reduced cooling costs contribute further to the savings: the American Society of Heating, Refrigeration and Air Conditioning Engineers estimates that one watt of cooling energy is required to offset the heat output for every three watts used to light a space. LED lighting requires much less wattage and generates much less heat to produce lighting levels comparable to older technologies.

Lighting controls can offer even bigger savings. Lighting controls have been around for decades, but most control systems are proprietary, non-interoperable, costly and difficult to install, reconfigure or even monitor. A 2016 DOE report describing the technology barriers to successful adoption of advanced lighting controls names Cree's SmartCast® Technology as a notable exception — highly intuitive, integrated and intelligent.

Across the board, the additional savings afforded by better and smarter LED technologies from Cree are markedly greater when compared to commodity-level LED lighting.

- **The most efficient Cree LED fixtures use 20 to 30% less energy than industry-standard LED fixtures**, while delivering light that is appreciably more uniform, consistent and appealing.
- **Cree's high-efficiency LED fixtures are often eligible for utility rebates** that reduce upfront fixture costs to a fraction of less-efficient luminaires.
- **Cree luminaires require virtually no maintenance for decades**, have the industry's leading warranties, and eliminate the toxic wastes of fluorescent and metal halide fixtures.
- **Cree's embedded sensors and intelligence in every SmartCast® fixture automatically give you an intelligent, adaptive platform** — without the need to install separate lighting control networks.

CREE ⇄
SMARTCAST® TECHNOLOGY

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SMARTER BUILDINGS FOR FUTURE SAVINGS

With today's advanced LED technology, your LED lighting can easily integrate with your building management system for enhanced monitoring and control. As smart buildings continue to evolve, a "future-ready" LED upgrade can even lay the foundation for an enterprise-level "central nervous system" to ultimately help monitor and manage your entire facility.



With Cree SmartCast® Technology, the lowly plenum may become the most valuable and hardworking real estate in your facility: a "digital ceiling" of networked power and intelligence for the future.

Among consulting and specifying engineers who specify, design or make product selections for hospitals and healthcare facilities, 64% listed "lighting controls sequence of operations, integration, etc." as a top challenge — and 65% cited "interoperability and complementing systems."⁴⁰

Cree's SmartCast® Technology allows "one-button" commissioning of hundreds or even thousands of fixtures at once, providing greatly simplified daylight harvesting, motion sensing, adaptive lighting and dimming without third-party devices, additional wires or complex manual commissioning, all for about 50 percent of the installed cost of other solutions.

Once the infrastructure is deployed, a wide variety of economical applications and use cases become available, using both sensors and the ability to control lighting. Based on time of day, the color temperature of a facility's lighting can be programmed by network command to automatically go from warm to cool. Lights that automatically change outside a conference or exam room can let you easily know if it's vacant. Facility managers can relocate, unplug and replace lights without additional training or cost.



SmartCast® solutions additionally enable an LED installation to provide a scalable intelligence starting with baseline strategies such as occupancy detection and sophisticated daylight harvesting, and later extending to provide a high level of intelligence to the overall energy and building management ecosystem.

Healthcare facilities have a multiplicity of complex systems such as HVAC, plumbing, smoke and fire, security and safety that must respond to dynamic conditions, and all are candidates for greater efficiency, control and interaction. What's needed are open, interoperable and secure standards and protocols to get all the systems talking to each other — and sophisticated apps to gather and make sense of the big data that inter-networked systems can generate.

Most interior facility lighting is housed in the plenum — that space between the ceiling above you and the underside of the next floor, home to the wires and conduits, pipes, HVAC conduits and other infrastructure devices and channels. With Cree's SmartCast® Technology, the lowly plenum may become the most valuable and hardworking real estate in your facility: a "digital ceiling" of networked power and intelligence. Any number of sensors and wireless communication devices can piggyback on this digital framework, enabling microphones and cameras, motion, temperature and humidity sensing, RFID readers, device tracking, emergency alerting and more.

The scalability of SmartCast® Technology offers increased value and efficiency as the platform becomes networked and connected to other devices, giving facilities the ability to monitor and adjust for occupancy patterns, resource utilization and other smart, cost-saving controls in the future.

CONCLUSION

Like so much else today, lighting is undergoing a revolution, swept up by the same convergence of trends and technologies that's transforming every aspect of how healthcare is delivered.

With clinical outcomes, financial performance and brand equity becoming increasingly dependent on the effective application of lighting best practices, a healthcare facility's ability to fully realize all the possible benefits will depend on more than a switch to LED lighting.

A smart, sustainable and future-ready lighting solution will reap enormous paybacks today — dramatic energy savings, better patient experiences and outcomes, gains in staff performance and satisfaction, better safety and security, and enhanced brand appeal — while providing an integrated, future-ready and scalable platform for harnessing the power of the medical Internet of Things and big data, without excessive cost and burdensome complexity.

Taking a strategic approach to LED lighting can reap bottom-line gains that may dwarf even the most dramatic energy savings, while giving you a notable advantage against one of today's top healthcare priorities: delivering a better patient experience.

Taking a strategic approach to LED lighting can reap bottom-line gains that may dwarf even the most dramatic energy savings.



Cree has innovated advanced LED technologies for healthcare around an ethos we call **Better Light**. **Better Light** is our vision for an informed and informative LED lighting platform enabling higher productivity, heightened sense of well-being, greater safety, security and comfort. **Better Light** speaks to beautifully illuminated spaces wherever people work, rest and heal.

Better Light improves every aspect of healthcare:

- 

Visually appealing; easy to design, install and operate; and provides intuitive functionality
- 

Increased end-user control and adaption to individual preferences in lighting and environmental systems
- 

Greater energy savings, scalability and flexibility, and connected and intelligent operation
- 

Simplified fixture monitoring and maintenance, re-configuration, upgrades and expansion
- 

Real-time data visibility and decision-support for facilities, traffic control, safety and security
- 

All without any compromise to maximizing your energy savings

Footnotes

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