FOCUS ON DESIGN

Luminaires Provide a Remedy for Patient Comfort and Healing

By Jeff Gatzow

Healthcare construction has dramatically changed over the years. Architects, designers and builders now have myriad considerations with each project, such as evidence-based design (EBD), LEED certification and green building, and implementing systems to help control energy costs.

Much research has been conducted linking healthcare facilities' physical structure to improved care. These studies support the theory that improved patient comfort shortens hospital stays, lessens recovery time, and increases the medical team's satisfaction and productivity.

While there are many products and tactics to confront lowering energy bills, reducing waste and improving patient outcomes, one — energy-efficient lighting — addresses all of them.

Typically, LEDs were thought about only for aesthetic uses. But engineering and technological advances have improved LED luminaires' output, and it is possible to use high-efficiency LED lighting for commercial applications. Additionally, with their compact size, LEDs can be used in places unreachable with conventional lighting and arranged in a number of different array configurations.

Lighting and MRI Suites

One area of a healthcare facility that has lighting challenges is the MRI suite. LED lights are MRI safe because they do not use filaments that can react with magnetic fields, and they do not emit radio frequencies. Lighting in MRI suites is challenging because of the short life of incandescent bulbs. Fluorescent lights can't be used either, because they generate noise artifacts on patient scans. Some imaging facilities experience weekly light outages, which shut down the MRI suite for mainte-

nance and costs up to $20 per minute when the MRI suite isn't operating.

By not having a filament, LED lighting also eliminates the potential for an image-degrading artifact that can appear when an incandescent bulb's filament is cracked.

Patient Comfort and Improved Outcomes

According to the book *Green Healthcare Institutions: Health, Environment and Economics* by Howard Frumkin and Christine Coussens, buildings that are brighter and more in tune with the environment help patients heal faster and may even reduce the likelihood of medical errors.

Many times when people come in for an MRI, they're claustrophobic, anxious, stressed and scared. They walk into the suite nervous, and if it's a sterile environment, that anxiety keeps building. However, if they come into a room with subdued lighting and relaxing images to view, it helps to take their minds off what they're going through. Patient comfort graphics on either the ceiling or wall in an MRI suite that are evenly backlit with LED luminaires address patients' anxieties.

According to a study conducted in 2004 by Roger Ulrich, Craig Zimring and colleagues in a report for The Center for Health Design and supported by the Robert Wood Johnson Foundation, the following can improve patient outcomes and lessen hospital stays:

- Bright light, either natural or artificial, can improve patient outcomes, affecting such factors as depression, agitation, sleep, circadian rest/activity rhythms and length of stay. Sunlight has been linked with shorter stays, lower stress, less pain, lower intake of pain medication and even lower mortality. For staff, ensuring that appropriate, nonglare light levels are brought to the tasks at hand can improve staff accuracy and effectiveness.
- Access to nature. Research has repeatedly demonstrated the emotional and physiological benefits of visual and physical access to nature: Stressful and negative emotions decrease while pleasant emotions increase. Patients viewing nature recover faster; have less stress, anxiety and pain; and require less pain medication. Gardens located in healthcare settings offer patients, visitors and staff the opportunity for direct interaction with the restorative, calming effects of nature.
- Positive distractions. The term "positive distractions" refers to several socio-environmental features — music, laughter, pets and realistic art (preferred over abstract by most patients), as well as natural elements such as trees, flowers and water — the presence of which improve mood and relieve stress. These positive distractions attract and sustain attention, produce positive reactions, and alleviate stress and anxiety.

Looking Ahead

Nearly $200 billion of healthcare construction is expected by the year 2015, with dramatic and innovative advances in sustainable and EBD products. And while high-quality healthcare must be the driving factor in facilities' new construction or renovations, by identifying technologically advanced products, such as LED luminaires, early in the process, it is possible to achieve patient comfort without sacrificing services, care or budget. FC

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