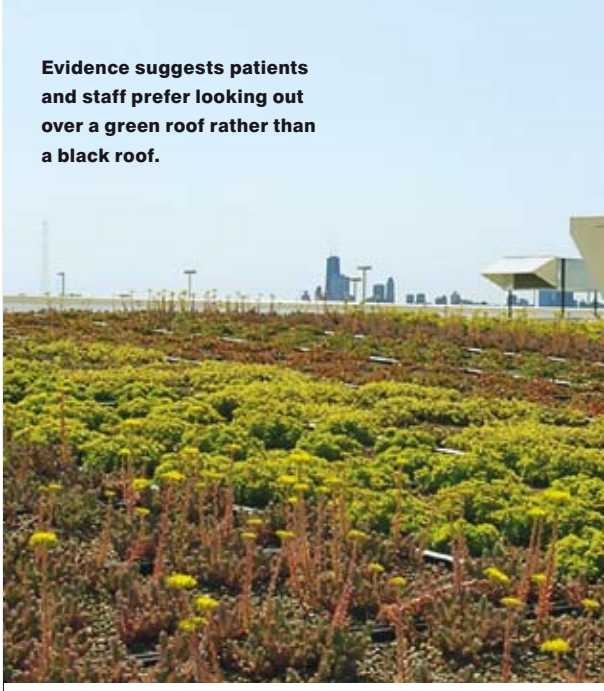

Evidence suggests patients and staff prefer looking out over a green roof rather than a black roof.

COURTESY OF WESTON SOLUTIONS, INC. GREENGRID GREEN ROOFS

GOING WITH GREEN ROOFS

CAN HOSPITAL SYSTEMS SAVE LIVES?

By Dawn Shoemaker

Green roofs have gained in popularity in recent years and are more commonly considered for healthcare facility designs, yet they remain far from widespread. Many building professionals believe the medical construction industry would be wise to take notice and learn more about the benefits of green roofs and the impact they could have on their businesses.

Benefits of Green Roofs

Studies indicate green roofs achieve significant results. For example, the National Research Council Canada reports green roofs, compared to a conventional blacktop flat roof, can significantly reduce average daily cooling requirements on facilities that are a few stories or less. Consequently, such a facility can reduce the size of its air-conditioning equipment and, in so doing, can lower its construction and operating costs.

Storm-water runoff is reduced by as much as 95 percent after a one-inch rainfall when a green roof is installed. The dramatic difference can prevent the need for more elaborate — and costly — roof drainage and retention systems while simultaneously reducing the impact on local drainage and sewer systems.

Also, green roofs soften noise on the floor directly beneath the roof. Studies indicate exterior noise is reduced by as much as 10 percent when a green roof is installed. Studies have also shown the views of nature benefit patients and staff.

"We are finding anecdotal evidence suggesting that patients much prefer looking out over a green roof rather than a black roof," said Sandra McCullough, a LEED-accredited professional with Weston Solutions' GreenGrid Green Roofs. "There is much data suggesting that green buildings improve the health and productivity of workers."

Acting on this evidence, Northwestern Memorial Hospital in Chicago recently installed a green roof on its new Prentice Women's Hospital, and Beloit Hospital has recently installed a green roof that can be seen by patients and employees.

The Cost of Medical Mistakes

In 1999, the Institute of Medicine released the landmark report "To Err Is Human," which estimated that medical mistakes are costing the United States between $17 billion and $29 billion annually.

To remedy the situation, the report emphasized a "systems" approach to facilities, including the way they are designed, built and maintained. The goal of the report was to look at the medical setting holistically and consider how entire hospital systems could be changed to make facilities healthier and reduce the number of deaths.

One significant systems change is to adopt sustainable technology in general.

"Hospitals are dangerous places because of some systems, and systems are a design problem," said Derek Parker, co-founder of the Center for Health Design, a nonprofit think tank, and a director at Anshen + Allen Architects, a San Francisco, Calif.-based healthcare design firm. Parker also said hospitals must look beyond building fancy entries or installing decorative carpets, furni-

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ture and other aesthetic elements, and awaken to the possibility that new hospital systems and design can save lives.

Many medical facilities are reluctant to experiment with new, untested design changes or facility operations because of the possible added costs involved. According to financial consultants Kaufman, Hall & Associates, "More than half of U.S. hospitals and healthcare systems struggle financially in the face of competitive pressure from physician-owned facilities, increasing uncertainty about the future of government-based payments and the financial strain of high debt loads, infrastructure improvements and technology-related expenditures."

Parker believes any added costs in improved hospital systems or design will pay off, not only in fewer patient deaths and staff errors, but in reduced operating costs as well.

"It costs a lot of money to build [and run] a poor hospital and only a little more to build a better hospital," he said.

Kaiser Goes Green

Kaiser Permanente is a good example of a hospital facility taking a systems approach to building design and operation. With more than 63 million square feet of medical space at various locations around the U.S., Kaiser believes it can correlate patient outcomes with design, and is doing this by taking into consideration everything from the direction a patient's room faces, to the products used to clean the room. It is also incorporating a variety of green measures, from green cleaning chemicals to low-PVC flooring. Kaiser is also among those companies that sees the benefits of green roofs.

Different Types of Green Roofs

"Green roofs are not rooftop gardens or healing gardens with trees and shrubs, as are found on some medical facilities," explained McCullough. "Instead, Kaiser [Permanente] and other facilities are installing extensive green roofs, which involves the placement of very low-maintenance, ground-cover plants such as sedum, grasses and other smaller species. The plants and growth media [soil] are placed directly on top of the existing roof."

According to McCullough, some green roofing systems are built directly on the roof, requiring several laborers to haul plants, soil and other components to the rooftop, where the green roof is then installed. Another system uses modules, which are planted off-site by a professional landscaping company.

"Because so many hospitals are concerned about costs and might be unwilling to take a 'risk' by installing a green roof, a modular system might be a good option," said McCullough. "Modular systems tend to be less expensive than a green roof built on top of an existing roof."

Studies from Europe, where green roofs have been common since the 1970s, indicate the life expectancy of an existing roof under a green roof can double. This is because membranes under green roofs are not subject to the vast swings in temperature of typical roofs and are protected from ultraviolet light. This can prove to be a significant savings for a medical facility.

Green for Green's Sake?

"No hospital should go green just for green's sake," said McCullough. "They should always evaluate [implementing green systems], including green roofs, and if they determine going green can improve patient health, safety or outcomes, or help reduce building operating costs, then it should be strongly considered."

McCullough said incorporating green components into a medical facility should always be viewed as a system in and of itself, which is usually only as strong as its weakest link.

"If a green roof is installed but an antiquated or poorly functioning HVAC system is in place, many of the energy-saving benefits of the green roof may be lost," she said. "It's the big picture that is important. The goal must be that all hospital systems and design features work together to help improve the overall health of the facility."

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