

Greening Health Care

May/June 2009

Quality Matters is a newsletter from The Commonwealth Fund. Published bimonthly, the newsletter explores issues of quality and efficiency in health care.

Past issues of *Quality Matters* are available on The Commonwealth Fund Web site at www.commonwealthfund.org/Publications/Newsletters/Quality-Matters.aspx

Published May 21, 2009

Welcome to *Quality Matters*, a bimonthly roundup of news and opinion on quality and efficiency, information technology, performance improvement initiatives, and policy innovations.

In Focus: Health Care Leaders Seek to Create Healing Environments for Patients, Staff, and the Broader Community	1
Case Study: Lowering Health Care Costs Through Energy Efficiency	5
News Briefs	11
Recent Publications of Note	14
Editorial Advisory Board and Team	17

In Focus: Health Care Leaders Seek to Create Healing Environments for Patients, Staff, and the Broader Community

Summary: *There is a substantial body of research demonstrating that the environment in which patients receive care influences their outcomes. And, as more health care facilities seek to "go green," they are finding the link between sustainability and health is even broader.*

By Vida Foubister

More than 20 years ago, Roger S. Ulrich, Ph.D., a professor of architecture at Texas A&M University, published an article in *Science* reporting his findings that surgical patients with a view of nature recovered faster than those with rooms facing a brick wall. Patients recovering with such views also needed less potent pain medication than the brick wall patients.

But it's taken a while for health care facilities to act on such findings, which indicate that a patient's physical environment can have a direct impact on their safety and quality of care.

"The reason being," says Robin Guenther, a leading sustainable health care design architect, "is that the green building tools which were

around then didn't make the connection between sustainable building and health.

Since the development of the Green Guide for Health Care, a green building and operations guide for the health care industry, which was piloted in 2004, this has started to change. As of October 2008, 35 health care facilities were LEED certified. LEED, which stands for Leadership in Energy and Environmental Design, is a green building rating system developed by the U.S. Green Building Council. (Though this certification is not specific to health care facilities, which have particular structural and regulatory challenges, LEED for Healthcare is under development.)

Health care leaders also have been influenced by the work of some pioneering institutions to adopt sustainable building plans and operations. These tend to include facilities in environmentally progressive communities, such as Boulder Community Foothills Hospital in Boulder, Colo., which was the first U.S. hospital to earn LEED certification. Religious health care organizations, the missions of which often include being good stewards of God's resources, have also been leaders in this area. St. Mary's Health Care in Grand Rapids, Mich., for example, received LEED certification for the Links Cancer Center, which was sustainably built and completed in 2005.

Whether hospitals and other health care organizations are trying to improve the care environment for their patients, staff, and visitors, or more broadly to protect the planet's health, they are increasingly interested in sustainable design and operations. "The vast majority of clients seeking to begin health care projects now are asking for some level of LEED certification," says Guenther, a principal at Perkins+Will, a commercial architect design firm, and a lead author of the Green Guide for Health Care.

Building Green

There are a growing number of rigorous, peer-reviewed clinical studies that support evidence-based health care design, a process in which decisions about the built environment are based on credible research to achieve the best possible outcomes.

Ulrich and colleagues summarized about 1,000 such studies last year, including those that found relationships between the physical setting of care and the following: patient safety issues such as infections, medical errors, and falls; other patient outcomes such as pain, sleep, stress, depression, length of stay, spatial orientation, privacy, communication, social support, and overall patient satisfaction; and staff outcomes, such as injuries, stress, work effectiveness, and satisfaction. A second paper, published last year by the National Association of Children's Hospitals and Related Institutions, reviewed the pediatric evidence-based design literature (see Related Publications).

Overall, the message is that well-designed health care settings are safer and more healing for patients, as well as being better places for staff to work.

Patients in rooms with exposure to natural daylight, for example, have been found to have better outcomes, says Ulrich. "Natural daylight studies suggest we have to take daylight more seriously. Unless buildings are designed in an architecturally appropriate manner to provide daylight to patients, then there will be significantly higher depression, quite possibly longer stays, and certainly higher levels of pain, with higher operational costs associated with them."

Similar findings hold true for health care workers. Staff who work in rooms with daylight exposure are more likely to report higher levels of job satisfaction than those

who don't. Because staff satisfaction ultimately impacts retention, something as simple as ensuring treatment and exam rooms have access to natural daylight can affect a hospital's bottom line.

"Sustainable design is moving more to the center of clinical concerns and actually affecting outcomes, care cost, and care quality for the patient in ways that can be directly measured, which are subject to a financial analysis and payback time analysis in relatively direct manner," says Ulrich.

Research also supports the importance of single-bed rooms, effective ventilation systems, a good acoustic environment, natural distractions such as nature views and gardens, appropriate lighting, good ergonomic design, acuity adaptable rooms, and better floor layouts and work settings, on improving patient outcomes.

While it's more cost-effective to ensure these features are included in an institution's building plans, there are some relatively low-cost improvements that can be made to existing buildings. Switching to ceiling tiles that absorb sound, for example, can improve the acoustics of patient rooms, and better lighting in pharmacy and medication rooms can help to reduce medication errors.

Sustainable Operations

Another evolving component of green health care is to evaluate the impact of a facility's day-to-day operations on patients and staff, as well as the community.

"One of the transformations that health care needs to go through in the next decade or so, is going beyond looking at the individual patient and looking at a much bigger set of factors that contribute to disease," says Gary Cohen, co-executive director, Health Care Without Harm.

Hospitals have, to some extent, started to do this. In 1996, the Environmental Protection Agency reported that medical waste incineration was the greatest source of dioxin contamination in the atmosphere. Since then, hospitals have reduced their red-bag or infectious medical waste and found other ways to dispose of the remaining waste. As a result, the number of incinerators in operation has declined from 5,000 in 1996 to fewer than 100 today. In addition, mercury, a neurotoxin that has been used for decades in thermometers and other measuring devices, is close to being completely eliminated from most U.S. hospitals.

Managers in charge of environmental services—such as those at North Bronx Healthcare Network, which is part of the New York City Health and Hospitals Corporation—have been motivated to evaluate their cleaning products, in part due to the prevalence of asthma in their local community.

"New York City kids are twice as likely to [be hospitalized for] asthma as children in other parts of the country," says Peter Lucey, senior associate director of support services for Jacobi Medical Center and North Central Bronx Hospital, which make up the network. In particular, the Bronx has the highest incidence of asthma in the city.

After switching first to a product that didn't meet their needs, the network identified an economical line of highly concentrated **Green Seal**-certified cleaners with an advanced dispensing technology. This product is diluted using tamper-proof machines, thus limiting staff exposure to concentrates. Using this product line, the network decreased the number of cleaners in use at both facilities from 11 to three, reduced its waste as a result of the smaller-size containers holding the concentrates, and eliminated staff absenteeism due to accidents,

such as splash injuries, and respiratory ailments (Figure 1). It also "saves us money," Lucey says.

Figure 1. Decline in Staff Absenteeism Following North Bronx Healthcare Network's Switch to Green Cleaners in 2005

Year	Injury Reports	Lost Staff Days
2004	15	54
2005	9	28
2006	4	7
2007	3	0
2008	1	0

Source: North Bronx Healthcare Network, 2009.

Hospitals have also started looking at the chemicals in their I.V. and blood bags, plastic tubing, and other medical supplies, selecting products without PVCs (polyvinylchloride) and phthalates. They are evaluating their

indoor flooring and selecting options that require less maintenance, and choosing porous paving materials outside, which limit slips and falls. They are using reusable dishes in their cafeterias and buying locally and sustainably grown food. They are also looking to reduce their energy use, in some cases working towards a zero carbon footprint (see Case Study).

"To me, the big message is that there now is a real connection between the kind of physical spaces we care for people and work in and actual patient outcomes," says Blair L. Sadler, senior fellow at the Institute for Healthcare Improvement and past president of Rady Children's Hospital in San Diego. "There is a business case—as well as an ethical case—for building the right kind of environments. It's not about pretty buildings and expensive tapestries on the wall, it's about making better places to care for people and for them to recover."

Green Health Care Organizations

The [Center for Health Design](#) is a research and advocacy organization that works to improve health care quality through building architecture and design. Its Pebble Project helps organizations evaluate the effect of a facility's design on health care quality and organization costs.

[Health Care Without Harm](#) is an international coalition of hospitals and health care systems, medical professionals, community groups, health-affected constituencies, labor unions, environmental and environmental health organizations, and religious groups committed to making health care ecologically sustainable.

[Practice Greenhealth](#) is a nonprofit membership organization formed from the merger of Hospitals for a Healthy Environment, the Green Guide for Health Care, and the Healthcare Clean Energy Exchange. Its members include hospitals, health care systems, businesses, and other stakeholders "engaged in the greening of healthcare to improve the health of patients, staff, and the environment."

[U.S. Green Building Council](#) is a nonprofit organization that works to expand sustainable building practices. It developed the Leadership in Energy and Environmental Design (LEED) green building rating system, a third-party certification program and the nationally accepted benchmark for the design, construction, and operation of high performance green buildings.

Related Publications

- R. Ulrich, [View Through a Window May Influence Recovery from Surgery](#), *Science*, April 27, 1984 224(4647):420–421.
- R. Ulrich, C. Zimring, X. Zhu et al., [A Review of the Research Literature on Evidence-Based Healthcare](#)

Design, Health Environments Research and Design Journal, 2008 1(3):61–125.

- A. Joseph, A. Keller, and K. Kronick, *Transforming Care in Children's Hospitals Through the Design: Literature Review*. In *Evidence for Innovation: Transforming Children's Health Through the Physical Environment* (Alexandria, Va: National Association of Children's Hospitals and Associated Institutions: 2008:18–47).
- B. L. Sadler, A. Joseph et al., *Using Evidence-Based Environmental Design to Enhance Safety and Quality* (Cambridge, Mass.: Institute for Healthcare Improvement, 2009).
- *Transforming Hospitals: Designing for Safety and Quality* (Rockville, Md.: Agency for Healthcare Research and Quality, September 2007).
- *Health Care at the Crossroads: Guiding Principles for the Development of the Hospital of the Future* (Chicago, Ill.: Joint Commission, 2008).

Case Study: Lowering Health Care Costs Through Energy Efficiency

By Sarah Klein

Summary: *Concerned that it was wasting financial resources that would be better spent on health care, a Wisconsin-based health system embarked on an ambitious plan to reduce its energy use by more than 30 percent and to offset its remaining consumption with renewable energy projects, including one with a local brewery that will convert the brewery's waste into electricity. The health system's goal is to produce as much clean energy as it consumes by 2014, using techniques that have quick paybacks so that savings from reduced energy use can be used to support the institution's health care mission.*

Issue

Commercial office buildings are often criticized for wasting energy by using inefficient methods to keep occupants cooled and rooms well lit. But hospitals, which operate 24 hours a day, seven days a week, consume two-and-a-half times as much energy as office buildings and emit two-and-a-half times as much carbon dioxide, according to the U.S. Department of Energy.

Such consumption is not only bad for the environment and local residents, it also puts hospitals and health systems at financial risk when prices for natural gas and electricity rise, as they have since 2000. Leaders at Gundersen Lutheran Health System, a La Crosse, Wis.-based integrated health system, estimated that if recent price trends held true, the system's energy bills would rise \$500,000 every year (Figure 1).¹

Concerned that the system was wasting resources that would be better spent on health care, Gundersen Lutheran's leaders set out to lower its energy use in a way that would save both energy and money. "A lot of organizations are buying carbon credits or buying green energy and they are paying a premium to do that. We don't believe that is the right solution because we are increasing the cost of health care if we do that," says Jeff Rich, Gundersen Lutheran's executive director of major projects and efficiency improvement.

Lowering health care costs, while improving community health, is part of Gundersen Lutheran's long-term strategy.

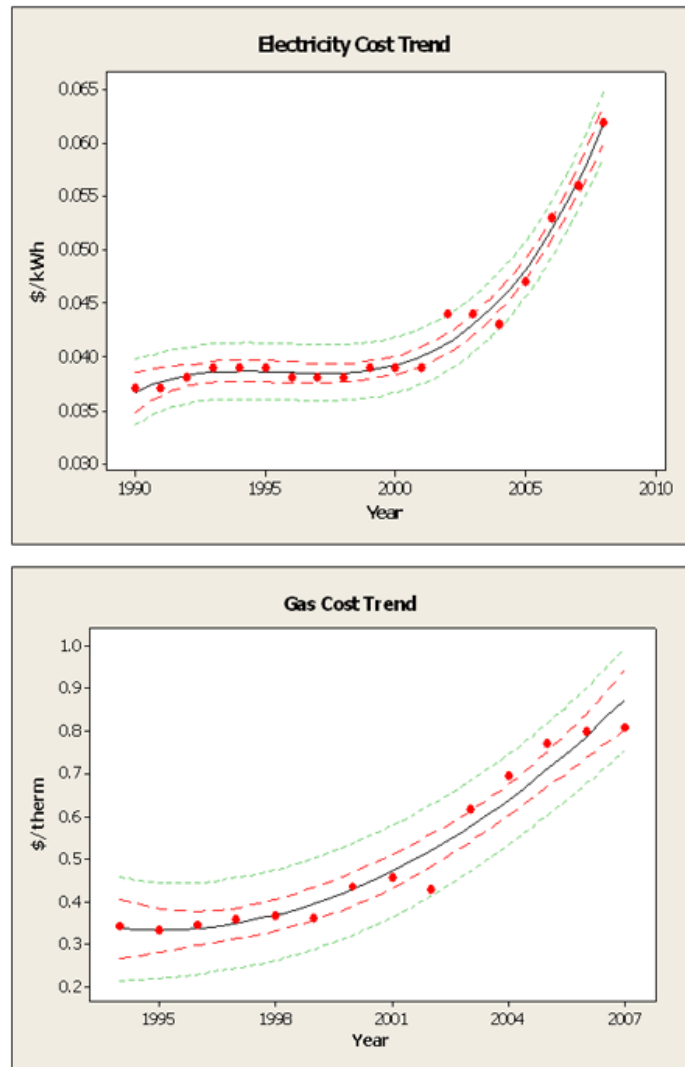
Objective

Gundersen Lutheran aims to be "carbon neutral" by 2014, meaning that it will use not use more energy from fossil fuels than it

produces from renewable sources by that year. To do so, the health system must reduce the demand for energy in its existing facilities by 30 percent and reduce the need for energy in new construction by 50

percent. Savings from those projects will be used to help finance renewable energy projects, which will offset the system's remaining energy use.

Figure 1. Trends in Gas and Electricity Costs at Gundersen Lutheran



Source: Gundersen Lutheran, 2009

"Not only do we feel it is the right thing to do from an environmental standpoint, we think it will improve health," says Jeff Rich. "By dropping carbon emissions we actually

can improve the air quality and the health of the community and we believe that it is a hedge against inflationary pressures we are seeing from energy prices. And we believe

we can drop the cost of health care with this program."

Organization and Project Leadership

Gundersen Lutheran is a not-for-profit health system serving a tri-state region that includes parts of western Wisconsin, northeastern Iowa, and southeastern Minnesota. Created by the 1995 merger of the Gundersen Clinic and La Crosse Lutheran Hospital, it includes a 325-bed teaching hospital and 34 clinics, which provide medical, podiatry, behavioral health, eye, dental, and sports medicine services.

The health system's energy efficiency program, known as Envision, is led by Rich, a mechanical engineer, and Corey Zarecki, a chemical engineer. Both previously worked for Trane Inc., which manufactures heating and ventilation equipment for commercial and residential buildings. Tom Thompson, Gundersen Lutheran's sustainability coordinator, leads the health system's recycling, waste management, and environmental education programs.

Target Population

Gundersen Lutheran is located in the upper Midwest, an area of the country that experiences hot and cold temperature extremes, which creates a demand for air conditioning or heating year round. Despite high temperatures in summer months, the area lacks the consistently intense sunlight necessary to justify large-scale solar technology projects. The region does have other local resources suitable for renewable energy projects. Those include the Mississippi River, which can generate electricity through hydropower techniques, and sources of biomass such as forests and agricultural residues, which can be converted to fuel without creating greenhouse gases.

Plans are under way to construct a 156-bed critical care hospital using energy efficient glass, insulation, and ventilation equipment. However, many of the health system's existing facilities, including its hospital and the physical plant that supports it, were built more than three decades ago and need to be updated.

Key Measures

To determine the health system's energy use at the start of the project, the energy efficiency team analyzed more than 10 years' worth of site-specific utility bills. They found that the health system used 45 million kilowatt hours of electricity and 220 million cubic feet of natural gas, which cost \$5 million in 2007 (the bill rose to \$5.5 million last year). On a per square foot basis, this translates to an annual energy use of 250 to 235 kilo British thermal units (kBtu). The team believes that energy use in the new hospital can be reduced to 125 to 115 kBtu per square foot.

Process of Change

Gundersen Lutheran's energy efficiency program followed a phased approach, which began with small, easily achievable steps and progressed to more elaborate plans, which required time and capital to develop (Figure 2).

Phase I

The program began with an energy audit, which helped identify low- and no-cost ways to reduce energy use. Conducted in February 2008, the audit revealed a number of opportunities to save money and energy by optimizing the use of existing equipment. For instance, the health system switched from using three low-pressure boilers to create steam heat to warm buildings to using two high-pressure boilers, which were

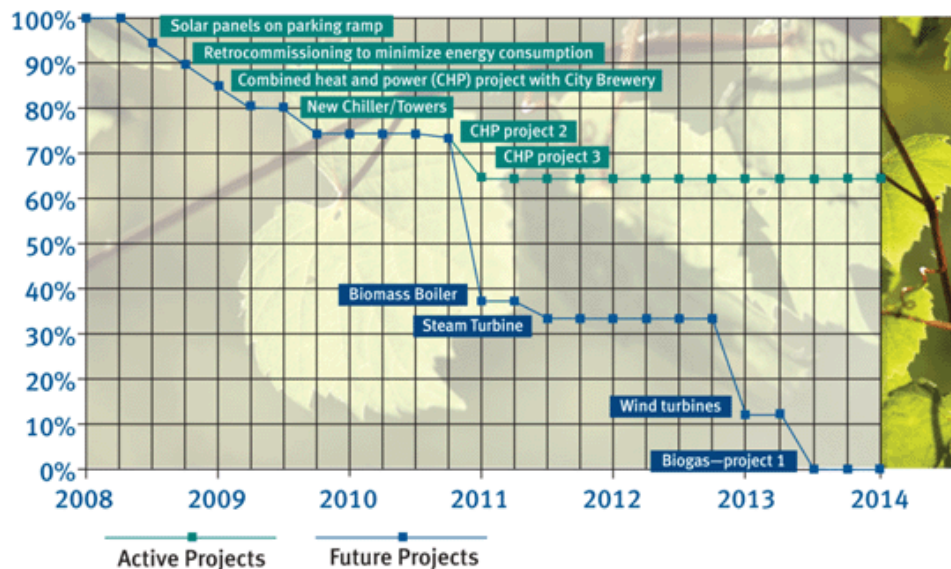
already running to sterilize equipment. The adjustment is saving the health system \$64,000 per year.

The audit also showed that the clinic's chillers—which are used to cool campus buildings—would use less energy if a buildup of calcium carbonate were removed from their copper tubing. The calcium carbonate, which comes from the hard water supply,

impedes heat transfer, increasing the amount of work the chiller motors must do. The addition of an acid feed—at a cost of slightly more than \$2,000—has saved the health system more than \$20,000 annually. Also, adding controls to the exhaust fans used to ventilate laboratories and pharmacies and scheduling their use to ensure that equipment does not run unless it is needed will save more than \$30,000 per year.

Figure 2

Becoming Energy Neutral at Gundersen Lutheran



Gundersen Lutheran is implementing a number of projects to meet 100 percent of our energy needs for our facilities by 2014. The projects will create renewable energy and improve energy efficiency. The environmental plan will evolve and change as we learn more about the technologies that are available.

Source: Gundersen Lutheran, 2009

Phase 2

The audit identified additional changes the health system could make that would require more significant investment but would reap greater savings over time. One example was upgrading all the lighting devices in the hospital and clinic. By switching to more efficient fluorescent lamps (from T-12 tubes to T-8) and ballasts, the health system got

"better light for half the cost or less," Zarecki says. The new equipment will save the health system \$250,000 per year in reduced energy costs. Because re-lamping will cost more than \$1 million, it will take nearly six years for the health system to recover its initial investment. "The paybacks are a little bit longer than what you would expect a normal business to have. We have the kind

of commitment where you can stomach some of those longer paybacks," Rich says.

Gundersen Lutheran is also updating its existing power plant to replace decades-old equipment with high-efficiency machinery. Doing so will lower maintenance costs and ensure that the power plant is properly sized to meet the needs of the new critical care hospital the system plans to open in 2012. The new cooling equipment, which will be operational in June, will save 800,000 kilowatt hours per year—the equivalent of 2 percent of the campuses' energy use in 2007. The health system is also considering installing a biomass boiler, which relies on renewable sources of fuel rather than natural gas. Such boiler projects are expensive (ranging in price from \$1 million to \$6 million, depending on size and features), but using one could save the health system 150 million cubic feet of natural gas, or \$600,000 annually. Because the heating equipment accounts for as much as 40 percent of the health system's energy use, "it could make a big impact on our energy neutral goal," Rich says.

The health system is already using some renewable energy. A parking ramp on the La Crosse campus, which opened in 2008, uses a limited number of solar panels to generate 73,000 kilowatt hours of electricity per year, enough to light the parking garage. A new data center, under construction to house the health system's servers, is designed to capture heat generated by the equipment and vent it to a chiller. That building will also have a white roof to reflect the heat of the sun. A new clinic in La Crescent, Minn., will use high-efficiency heating, cooling, and lighting systems and will have a white roof to reflect sunlight.

Another renewable energy project is a partnership with the La Crosse-based brewery City Brewing Co. LLC. The health

system is installing equipment that will use microbes to convert the brewery's waste into electricity, using microbes. Methane gas, which is produced when microbes digest the waste, will be used as fuel for the generator that produces electricity. The electricity will be sold to the local utility to offset the electricity used by the health system.

Gundersen Lutheran estimates that the equipment will produce 3 million kilowatt hours of electricity per year, enough to offset 8 percent of the electricity used annually at the health system's campuses in La Crosse and Onalaska. The brewery benefits, too. Without the system, it is forced burn off the methane gas in a flare, which bothers community residents, Zarecki says. "They were questioned all the time: Why just let it go into the atmosphere?"

The health system is also considering other approaches to generate clean energy, including using turbines to harness the kinetic energy of the Mississippi River, which flows past the hospital. The health system may also be able to use landfills to produce biogas, which can be converted into electricity and fuel. Payback on such systems varies from five to 15 years, significantly less than the 50 to 100 years it would take to recover money from large-scale photovoltaic projects.²

The health system also encourages recycling of its waste, though it is technically exempt from any requirement to do so because it falls under a recycling waiver intended for a local utility. The system recycled 29 percent of its waste in 2008, which amounted to 440 tons of paper, cardboard, metal, and batteries. The health system also encourages carpooling by offering preferential parking spots to employees who travel together. Its lab couriers use hybrid vehicles.

Financing

The majority of Gundersen Lutheran's energy plan has been self-financed. It has invested roughly \$5 million in efforts to upgrade its existing equipment or make it more efficient and to build the system's renewable energy projects. Its strategy is to use savings from no- and low-cost energy reduction efforts to invest in energy renewal programs, which have a longer payback period.

The system hopes to obtain some federal money from the stimulus package for its efforts. But, to date, it has only received support from the state of Wisconsin's Focus on Energy program, which helps support energy efficiency efforts. That program typically covers 10 percent of projects costs, Rich says.

Early Results

By the end of 2008, Gundersen Lutheran had reduced its electricity use by 4 million kilowatt hours and its natural gas use by 16.5 million cubic feet, resulting in \$409,000 in annualized savings. By the end of the second quarter of 2009, the health system expects to double those savings. By the end of 2009, it will have offset its energy use by 25 percent, saving the institution \$1.25 million on expenses of \$5 million. The health system is on target to reach its goal of being carbon neutral by 2014. To reach that goal, the health system may spend between \$20 million and \$30 million, but will recover that investment through lower energy bills within five to eight years, Rich says.

Lessons Learned

Gundersen Lutheran has moved quickly to establish an energy efficiency program. Less than a year after conducting its initial energy audit, the health system committed to

spending \$5 million on equipment to make its operations more efficient and to invest in renewable energy. The health system's plans have changed frequently, as the energy efficiency team discovered new technologies with faster paybacks. Because energy technology is rapidly evolving, such programs require flexibility. They may also require a willingness to pursue partnerships, as most health systems don't have the resources—such as rivers or landfills and other commercial waste streams—to produce clean energy on site.

Lowering energy use in new buildings requires collaboration among architects, engineers, and institutions, as those parties' designs and plans influence one another. To ensure that Gundersen Lutheran's new buildings meet the system's 50 percent energy use reduction target, it is planning to hold the architects and contractors to this goal through a written contract. The architects "sweat a little bit when I talk about it," Rich says. "They know hospitals can be kind of fickle about what they request and won't make the tradeoffs that are kind of tough. But if we don't set a target, we'll never get there and we [may] end up with a building that is less efficient than our current space and has a worse carbon footprint."

The energy efficiency team at Gundersen Lutheran only selects approaches that save the institution money. But, because energy costs make up only 1 to 2 percent of the health system's budget, the team is evaluating whether its time would be better spent on improving hospital operations. "We continually ask ourselves: should we be doing this?" Zarecki says. The health system believes energy independence is an important goal, one that resonates not only with community members, but also with politicians, whose attention the health system needs in order to pursue its health-related goals.

When "we announced our environmental program and the lead piece of it...[that] we're going to take waste methane gas from the brewery and we're going to generate electrical power to power the hospital -- people were so excited," says Jeffrey E. Thompson, M.D., Gundersen Lutheran's CEO. "I got 10 times as many calls and notes about that as I did about the fact that [we had gotten five stars from Health Grades for outstanding clinical performance]."

Such attention builds goodwill. "It's a great sign of stewardship," he says.

Implications

Energy efficiency programs have the potential to reduce health care system expenses. But programs such as these must be carefully structured to ensure that they do not increase health system expenses or energy use. Gundersen Lutheran's example shows this can be done with careful monitoring of energy use before and after the project. Energy efficiency can be an important part of a health care organization's mission to set an example of corporate citizenship, though it is essential that such efforts do not distract from quality improvement efforts.

This study was based on publicly available information and self-reported data provided by the case study institution(s). The Commonwealth Fund is not an accreditor of health care organizations or systems, and the inclusion of an institution in the Fund's case studies series is not an endorsement by the Fund for receipt of health care from the institution.

The aim of Commonwealth Fund-sponsored case studies of this type is to identify institutions that have achieved results indicating high performance in a particular area of interest, have undertaken innovations designed to reach higher performance, or exemplify attributes that can foster high performance. The studies are intended to enable other institutions to draw lessons from the studied institutions' experience that will be helpful in their own efforts to become high performers. It is important to note, however, that even the best-performing organizations may fall short in some areas; doing well in one dimension of quality does not necessarily mean that the same level of quality will be achieved in other dimensions. Similarly, performance may vary from one year to the next. Thus, it is critical to adopt systematic approaches for improving quality and preventing harm to patients and staff.

For Further Information
Contact Jeff Rich at jjrich@gundluth.org or Corey Zarecki at czareck@gundluth.org .

References

1. The health system had net income \$34.7 million on net patient revenues of \$732 million in 2008; this estimate is conservative because it assumes the health system will make no new hires, add no new buildings, and pursue no expansion plans.
2. Because the health system is tax exempt, it does not qualify for tax credits, which shorten the time it takes to recoup an investment in a solar project.

News Briefs

Health IT Gets a Boost

The American Recovery and Reinvestment Act of 2009, commonly known as the stimulus bill, includes about \$19 billion to

help subsidize the adoption of electronic medical records by hospitals and physician practices under the Health Information Technology for Economic and Clinical Health (HITECH) Act.

The HITECH funds, distributed through incentive payments under Medicare and Medicaid, would provide more than \$40,000 per physician and up to several million dollars to hospitals to adopt electronic medical records. To receive the payments, providers will have to demonstrate "meaningful use" of certified health systems. By 2015, providers that have not yet adopted electronic records will be penalized.

The Association of Medical Directors of Information Systems, an organization of physicians interested in health IT, has created a Web site, www.meaningfuluse.org, to track the debate over defining "meaningful use." David Blumenthal, M.D., head of the Office of the National Coordinator for Health Information Technology at the Department of Health and Human Services, has said that he expects to have a working definition for "meaningful use" by late spring or early summer. The Office has released an [operating plan](#) that details its plans to implement the health IT provisions in the HITECH legislation.

Meanwhile, technology companies hoping to capitalize on the stimulus funds have formed the [EHR Stimulus Alliance](#), which aims to educate doctors about the tools available to help set up electronic health records. These companies include Allscripts, Cisco, Citrix, Dell, Intel, Intuit, Microsoft, and Nuance Communications. The Alliance will use webcasts, a telephone hotline, and other communication channels to explain EHR technology and showcase case studies of where it has improved care. The group says it wants to reach a half of a million doctors.

Patients Do Not Receive 40 Percent of Recommended Care, Report Finds

The sixth annual [National Healthcare Quality Report](#), issued by the Agency for

Healthcare Research and Quality, finds that, while the quality of U.S. health care continues to improve, Americans still do not receive 40 percent of recommended care. For example:

- Only 40 percent of diabetic patients received three recommended preventive exams in the past year, and this rate has not improved over time.
- Only half of obese adults and children are given advice to exercise more and eat a healthy diet.
- Only three of 10 adults with mood, anxiety, or impulse disorders received appropriate treatment; the majority received inadequate treatment or no treatment at all.

The report tracks trends on 45 measures of effectiveness of care, patient safety, timeliness of care, patient-centeredness, and efficiency of care. Across all these quality measures, the median annual rate of change was 1.4 percent, with greater improvements for acute care than for preventive and chronic care.

It also found that, although the rates of avoidable hospitalizations have decreased overall since 2000, total national costs associated with potentially avoidable hospitalizations have increased in this same time frame.

Measures of patient safety have declined by nearly 1 percent each year for the past six years—in part because of a rise in health care-associated infections. U.S. Department of Health and Human Services (HHS) Secretary Kathleen Sebelius recently announced the availability of \$50 million in federal stimulus grants to help health care facilities prevent such infections. HHS will allocate \$40 million to create or expand state infection and surveillance programs and \$10 million to improve processes and increase the

number of inspections at ambulatory surgical centers.

National Healthcare Disparities Report

An accompanying report found that the U.S. has not made substantial improvement in narrowing health care disparities among racial and ethnic groups. The [National Healthcare Disparities Report](#), which takes into account 220 quality measures, found either no improvement or worsening care between 2000–01 and 2005–06 on 60 percent of the quality measures.

Blacks are twice as likely as whites to have a leg amputated because of diabetes, while pregnant black women are twice as likely as white women not to receive prenatal care during their first trimester, according to the report.

The disparities report did reveal some bright spots. For example, the rate of deaths per 1,000 discharges among African-American patients from complications potentially resulting from care declined between 2000–05.

Reducing Readmissions Focus of Legislation, IHI Initiative

Earlier this month, Sen. Michael Bennet (D-Co) announced a bill intended to reduce hospital readmission rates. The [Medicare Care Transitions Act of 2009](#) would create a nationwide network of community-based "transitional care coaches." These coaches would help patients manage their conditions and medications, provide follow-up care, and serve as a single point of reference for patients changing care settings. The proposed legislation is intended to improve quality of care and reduce costs. As many as one of five Medicare beneficiaries are readmitted to hospital after their initial discharge—many

for conditions that are considered potentially preventable.

Also this month, the Institute for Healthcare Improvement (IHI) launched the State Action on Avoidable Rehospitalizations (STAAR) Initiative, a major Commonwealth Fund-supported effort to reduce rehospitalizations by working across organizational boundaries in three states—Massachusetts, Michigan, and Washington. The initiative will engage health care payers, state and national stakeholders, patients and families, and caregivers at multiple care settings. It will provide a learning community, as well as targeted technical assistance to address systemic barriers to reducing avoidable rehospitalizations, and will expand to other states over time.

STAAR resources for state policymakers, providers, and others are posted on the [IHI Web site](#).

More Hospitals Meet Safety Standards, But Much Room for Improvement

The Leapfrog Group's 2008 Hospital Survey found that, while some progress has been made, most hospitals still are not meeting standards known to improve the quality and safety of care. Detailed results of the survey, which was voluntarily completed by 1,282 acute care hospitals across the nation, are available at www.leapfroggroup.org/cp.

Only 7 percent of hospitals met Leapfrog's standard for preventing medication errors, which requires hospitals to use computerized order entry systems for at least 75 percent of inpatient medication orders and to evaluate their CPOE tool to ensure it alerts prescribers to common, serious prescribing errors. Research indicates that CPOE systems could reduce the number of adverse drug events by 88 percent—potentially

preventing 3 million serious medication errors each year.

Nearly a third (31%) of hospitals met Leapfrog's standard for ICU physician staffing, and another 7 percent plan to do so by the end of 2009. This is a major improvement over 2002, when only 10 percent of hospitals met this standard. It requires hospitals to use intensivists for care management in the ICU at least eight hours a day, seven days a week. Mortality rates are lower in hospitals where ICUs are managed by intensivists, who are trained in critical care medicine.

In 2008, 65 percent of hospitals did not have all recommended practices in place to

prevent hospital-acquired infections—which kill nearly twice as many people as breast cancer and HIV/AIDS combined. Still, this represents an improvement from 2007, when 87 percent of hospitals did not have all recommended policies in place.

For the first time, the Leapfrog survey included measures of efficiency, defined as the highest quality and lowest resource use. Among surveyed hospitals, the efficiency standards were met by only 24 percent of hospitals for heart bypass surgery, 21 percent for heart angioplasty, 14 percent for heart attack care, and 14 percent for pneumonia care.

Recent Publications of Note

Selected articles on quality improvement from a number of journals, including the *American Journal of Medicine*, *Annals of Internal Medicine*, *Archives of Pediatric and Adolescent Medicine*, *BMJ*, *Health Affairs*, *Health Services Research*, *International Journal for Quality in Health Care*, *Joint Commission Journal on Quality and Safety*, *Journal of the American Medical Association*, *Journal of General Internal Medicine*, *Journal of Patient Safety*, *Journal of Safety and Quality in Health Care*, *Medical Care*, *The Milbank Quarterly*, *The New England Journal of Medicine*, and *Pediatrics*. The articles are nominated by Editorial Advisory Board members from a preselected list.

Quality Tools in Practice

Physician Connectedness Improves Quality

A population-based cohort study was used to determine if patient-physician connectedness affects measures of clinical performance. Based on a validated algorithm, 59.3 percent of the 155,580 assessed patients were connected to a specific physician, 34.5 percent were connected only to a specific practice, and 6.2 percent could not be connected to a physician or practice. The authors found that physician-connected patients were significantly more likely than practice-connected patients to receive guideline-consistent care. S. J. Atlas, R. W.

Grant, T. G. Ferris et al., [Patient-Physician Connectedness and Quality of Primary Care](#), *Annals of Internal Medicine*, March 3, 2009 150(5):325–35.

EMRs, Not Other Technology, Associated with Quality

This perspective sought to build on the evidence demonstrating a correlation between health information technology (IT) and clinical quality. To do this, the authors evaluated four years of Medicare patient data (1999–2002) to determine whether changes in patient safety correlated with hospitals' health IT investments. They found that the use of electronic medical records (EMRs) is

associated with reduced infections, an effect that grew with time. However, EMRs were the only health IT application that had a clear and statistically significant effect on patient safety. S. T. Parente and J. S. McCullough, [Health Information Technology and Patient Safety: Evidence from Panel Data](#), *Health Affairs*, March/April 2009 28(2):357–60.

Automated Medication Reconciliation Reduces Discrepancies, Nursing Time

The Portland, Ore., Department of Veterans Affairs developed a standardized medication reconciliation process to reduce discrepancies in medication documentation at its chemotherapy administration unit. Called the automated patient history intake device, this computer terminal kiosk is accessed by patients in the clinic lobby and simultaneously checks them in for appointments and gathers a medication-adherence history. The new process identified medication discrepancies, including some that were clinically significant or potentially lethal, and reduced nursing time dedicated to reconciliation activities without an apparent loss in data accuracy. B. Lesselroth, S. Adams, R. Felder et al., [Using Consumer-Based Kiosk Technology to Improve and Standardize Medication Reconciliation in a Specialty Care Setting](#), *Joint Commission Journal on Quality and Patient Safety*, May 2009 35(5):264–71.

Outpatient Medication Reconciliation Reduces Errors

This study followed the implementation of a medication reconciliation process by PeaceHealth Medical Group (PHMG), a multispecialty physician group in Eugene, Ore., in 2005. PeaceHealth developed a standardized approach to: (1) review and reconcile the medication list for every

patient at each office visit and (2) report on the results obtained within its clinics. The process resulted in a substantial increase in the number of accurate medication lists, with fewer discrepancies between the medications a patient is taking and those recorded in the electronic medical record. R. Stock, J. Scott, and S. Gurtel, [Using an Electronic Prescribing System to Ensure Accurate Medication Lists in a Large Multidisciplinary Medical Group](#), *Joint Commission Journal on Quality and Patient Safety*, May 2009 35(5):271–9.

Financial Incentives for Quality

Study: P4P Value Limited

The authors interviewed key stakeholders involved in the California Integrated Healthcare Association's statewide pay-for-performance (P4P) program to assess whether P4P changes physician behavior, ultimately leading to improved quality of care. They found that, three years into the program, California physician organizations had made changes in response to P4P, but that "these changes did not translate into the breakthrough improvements in quality desired by plans and purchasers." C. L. Damberg, K. Raube, S. S. Teleki et al., [Taking Stock of Pay-For-Performance: A Candid Assessment from the Front Lines](#), *Health Affairs*, March/April 2009 28(2):517–25.

P4P Measures Need Validation

This study analyzed hospital performance data from the Centers for Medicare and Medicaid Services/Premier Hospital Quality Initiative Demonstration and compared them with publicly available outcomes data. The authors found that hospital quality measures do not correlate with patient outcomes. They conclude that such measures should

not be tied to payments until they have been validated. T. Bhattacharyya, A. A. Freiberg, P. Mehta et al., [Measuring the Report Card: The Validity of Pay-for-Performance Metrics in Orthopedic Surgery](#), *Health Affairs*, March/April 28(2):526–32.

Survey: Financial Incentives Increase IT Use

A national survey of all U.S. medical groups and independent practice associations with 20 or more physicians in 2006–07 was used to assess the role of external incentives on physician use of clinical information technology (IT). The study, with a response rate of 60.3 percent, found IT use varied across these groups. However, physician organizations evaluated by external entities for pay-for-performance and public reporting purposes, and those participating in quality improvement initiatives, had higher levels of adoption. J. C. Robinson, L. P. Casalino, R. R. Gillies et al., [Financial Incentives, Quality Improvement Programs, and the Adoption of Clinical Information Technology](#), *Medical Care*, April 2009 47(4):411–17.

Quality Reporting

Public Reporting Might Widen Gap Between High- and Low-Quality Facilities

This study examined how public reporting affects the quality of care in clinical areas for which performance data are not being reported. It focused on non-targeted care in skilled nursing facilities, using the nursing home Minimum Data Set from 1999 to 2005 for all postacute care admissions. (Public reporting was initiated by the Centers for Medicare and Medicaid Services on their Nursing Home Compare Web site in 2002.) The authors found that public reporting had mixed effects on nontargeted care, improving it in high-ranking facilities but

worsening it in low-ranking facilities. R. M. Werner, R. T. Konetzka, and G. B. Kruse, [Impact of Public Reporting on Unreported Quality of Care](#), *Health Services Research*, April 2009 44(2):379–98.

Leapfrog Group Ranking and Morality Rates

The Leapfrog Group allows hospitals to self-report the steps they have taken toward implementing the Safe Practices for Better Healthcare as part of its Hospital Survey, and then ranks hospital performance by quartiles and posts this information on its Web site. This observation analysis sought to determine the relationship between a hospital's Safe Practices Score and risk-adjusted inpatient mortality rates. The study found no significant association. L. P. Kernisan, S. J. Lee, W. J. Boscardin et al., [Association Between Hospital-Reported Leapfrog Safe Practices Scores and Inpatient Mortality](#), *Journal of the American Medical Association*, 2009 301(13):1341–48.

Hospital Quality Alliance Data Used to Assess Individual Care Quality

A retrospective analysis of Hospital Quality Alliance patient-level data was used to assess the quality of care provided to patients hospitalized for acute myocardial infarction (AMI), heart failure, or pneumonia. Variations in quality by patient and hospital characteristics, and the sensitivity of all-or-none performance to the number and type of processes, were assessed. The authors found that 82.8 percent of AMI patients, 57.3 percent of heart failure patients, and 41.7 percent of pneumonia patients received all recommended care during their hospitalizations. C. Vogeli, R. Kang, M. B. Landrum, [Quality of Care Provided to Individual Patients in U.S. Hospitals: Results from an Analysis of National Hospital](#)

[Quality Alliance Data](#), *Medical Care*, May 2009 47(5):591–99.

[Readmissions?](#) *Medical Care*, May 2009 47(5):583–90.

Health Care System Performance

Hospital Safety Events Increase Readmission Rate

This study examined the effects of adverse safety events on readmissions among a population of almost 1.5 million adult surgery patients, initially treated in 1,088 short-stay hospitals, who are at risk for at least one of nine types of patient safety events. It found the one-month readmission rate was 11 percent for those with no safety events and 16 percent when a safety event was recorded. The three-month readmission rates were about 17 percent and 25 percent, respectively. B. Friedman, W. Encinosa, H. J. Jiang et al., [Do Patient Safety Events Increase](#)

Teaching Residents About QI

This perspective reviews the challenges to teaching quality improvement—defined as methods of improving the processes of clinical care—to medical residents and then makes recommendations on how to overcome them. Among the authors' suggestions are setting learner objectives; providing training over an extended period of time; obtaining support from faculty who teach clinical medicine; and showing the connection between evidence-based medicine and systems improvement. G. Mosser, K. K. Frisch, P. K. Skarda et al., [Addressing the Challenges in Teaching Quality Improvement](#), *American Journal of Medicine*, May 2009 122 (5):487–91.

Editorial Advisory Board 2008

Special thanks to Editorial Advisory Board members Paul Schyve and Bob Wachter for their guidance with this issue.

- David Blumenthal, M.D., M.P.P., director, Office of the National Coordinator for Health Information Technology, Department of Health and Human Services
- Eric Coleman, M.D., M.P.H., associate professor of medicine, University of Colorado
- Janet Corrigan, Ph.D., president and CEO, National Quality Forum
- Don Goldmann, M.D., senior vice president, Institute for Healthcare Improvement
- Thomas Hartman, vice president, quality improvement, IPRO
- Rosalie Kane, Ph.D., professor of public health, University of Minnesota
- Gordon Mosser, M.D., associate professor, School of Public Health, University of Minnesota
- Mary Naylor, Ph.D., R.N., Marian S. Ware Professor in gerontology, University of Pennsylvania School of Nursing
- Michael Rothman, director, Quality Improvement, Johns Hopkins Hospital
- Paul Schyve, M.D., senior vice president, Joint Commission
- Bruce Siegel, M.D., research professor, Department of Health Policy, George Washington University
- Robert Wachter, M.D., professor and associate chairman, Dept. of Medicine, University of California, San Francisco

Editorial Team

- Anne-Marie Audet, M.D., vice president, Program on Quality Improvement and Efficiency
- Vida Foubister, M.A., M.Sc., and Douglas McCarthy, M.B.A., contributing editors
- Sarah Klein, B.A., contributing writer
- Martha Hostetter, M.F.A., managing editor, mh@cmwf.org

Citation

Quality Matters: Greening Health Care, The Commonwealth Fund, May/June 2009, vol. 35.