DESIGNING THE 21st CENTURY HOSPITAL

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Designing the 21st Century Hospital: Serving Patients and Staff

Poor health care quality is a major public health issue in the United States. In fact, according to a landmark RAND Health study funded by The Robert Wood Johnson Foundation (RWJF), patients have only about a 50 percent chance of receiving appropriate care for their health problems.

For hospital patients, quality of care is strongly linked to the performance of nursing staff. Yet, over time, hospital nursing has increasingly lost its appeal as a career option. As a result, our hospitals are in crisis. Young nurses often work in the hospital for only two or three years before opting out. On average, hospital nurses are in their mid-40's, and the work is strenuous. Increasingly, nurses are being imported from countries that also need them at home.

Nationwide, some 15 to 17 percent of hospital nursing positions are vacant. Understaffed hospitals are more likely to experience errors and poor quality of care. According to Leonard Berry, professor of marketing and director of the Center for Retailing Studies at Texas A&M University, the problem is a national "shortage of nurses willing to work in hospitals."

The most promising long-term solution to the hospital nursing shortage is to provide nurses with a better, more supportive work environment—one where they can provide the best care they are capable of and where they want to work.

To that end, RWJF is focusing on ways of transforming the hospital work environment, using a holistic approach that addresses the "mind, body, and spirit" of hospitals. The "mind" part of the equation refers to work design and processes in hospitals; the "body" focuses on the physical design of the hospital workplace; and the "spirit" refers to the soul of an organization – its vitality, values, attitudes – its culture.

These three components overlap and interact. The idea is to transform hospitals into places that not only provide treatment but promote healing, where staff feel satisfied and supported in their jobs, and where better work processes and culture increase institutional vitality and enhance patient care.

On June 3, 2004, in Washington, D.C., RWJF and The Center for Health Design convened health care leaders from a variety of organizations to discuss the state of our nation's hospitals and a vision for the future. The focal point of their conversation was a new analysis of more than 600 research studies linking patient health and quality of care with the way a hospital is designed. The evidence from the analysis is overwhelming: The hospital environment has substantial effects on patient health and safety, care efficiency, and staff effectiveness and morale. In fact, there is a strong and growing science base for specific health care architectural elements that can improve patient outcomes, safety, and satisfaction, as well as staff retention and service efficiency.

After a morning of presentations that focused on the mind-body-spirit framework, meeting participants engaged in lively discussion of how this information could be utilized in reforming and improving our nation's hospitals. This conference paper is a distillation of that dialogue.

A System in Need of Improvement

The United States spends approximately 14 percent of its Gross National Product on health care, much of which is provided in hospitals. Yet, despite this enormous expenditure and the technological resources available, hospital care today frequently runs afoul of the cardinal rule of medicine: First, do no harm.

A series of landmark reports by the Institute of Medicine (IOM) documents the shortcomings of our nation's hospitals and offers a vision for addressing them. In 2000, the IOM report *To Err Is Human* showed that hospitals regularly fall far short of ensuring patient safety. Each year, as many as 98,000 patients in the United States die from preventable medical errors while in the hospital. In fact, more people die from hospital errors than from motor vehicle accidents, breast cancer, or AIDS.

The IOM issued *Crossing the Quality Chasm* in 2001, calling for fundamental repair of our "disjointed and inefficient" health care system. In *Keeping Patients Safe*, published in 2003, the IOM urged hospitals and other health care organizations to improve patient safety by improving the work environment. The four key areas targeted for improvement in *Keeping Patients Sa*fe – management, workforce deployment, work design, and organizational culture – are all issues embraced by RWJF's mind-body-spirit framework.

A principal theme that emerged from the IOM reports is the need for patient-focused health care that addresses patients' needs, goals, comfort, and fears. Presenters at the June 3 conference reaffirmed the importance of patient-centeredness by noting that the degree to which a hospital truly "places patients first" is reflected in its physical design, the way the work is organized, and its organizational culture—body, mind, spirit.

Reinventing Hospitals for Tomorrow

What is the hospital of today? Is it sustainable? Should it be?

These far-reaching and provocative questions challenged participants in the June 3 meeting. Ann Hendrich, R.N., vice president of clinical excellence at Ascension Health, St. Louis, noted that hospitals are complex environments, where births, deaths, and hundreds of medical interventions take place; where professionals from a variety of disciplines and backgrounds converge to provide care; where patients and their families come in search of healing and reassurance.

These complex environments are riddled with problems ranging from high levels of staff turnover to tremendous inefficiencies in work performance. Between 1997 and 2001, hospital spending increased by $83.6 billion; over the next 10 years, an aging population will place new demands on hospital services. Meanwhile, nurses spend as much as 70 percent of their time on administrative work unrelated to patient care.

And, as several presenters pointed out, hospital environments are exceedingly stressful – for patients, their families, and staff alike. Negative effects of stress include:

- Anxiety, depression, and anger (psychological);
- Increased blood pressure, elevated levels of stress hormones, reduced immune function (physiological); and
- Sleeplessness, aggressive outbursts, patient refusal to follow doctor's instructions, staff inattention to detail, and drug or alcohol abuse (behavioral).

"The writing is on the wall," Hendrich said, adding that hospitals need to reinvent themselves to meet the challenges of the 21st century.

What should the hospital of tomorrow be? One possible answer is this: A place where patient safety is assured; quality of care is paramount; efficiency is maximized; and staff feel satisfied with their jobs, are supported by management and by the work environment, and can do their best work.

The Body: The Impact of Physical Design on the Hospital of the 21st Century

"I'm here today because I believe that hospitals are unnecessarily stressful and dangerous places," Craig Zimring, Ph.D., of the Georgia Institute of Technology, told meeting participants. "The good news is that we've discovered a large body of research that points to some remedies for these problems."

Zimring and Roger Ulrich, Ph.D., of Texas A&M University, presented their findings from the most extensive review ever conducted of the evidence-based approach to hospital design. The review included thousands of studies; some 600 met Zimring's and Ulrich's criteria for rigor, impact, and applicability to future research. Zimring noted that a review conducted in 1998 by researchers at Johns Hopkins University yielded only 83 studies that met similar criteria. "We have a lot of good evidence right now that we can operate on," he said.

That evidence needs to be put into action. In addition to the tens of thousands of preventable hospital errors that occur each year, up to 2 million U.S. hospital patients – 1 in 20 of all those admitted – contract dangerous infections during their hospital stays. In 1995, hospital-acquired infections cost $4.5 billion and contributed to more than 88,000 deaths.

The design of the hospital environment contributes to all these problems. Poor air quality and ventilation, combined with having two or more patients in the same room, are prime causes of nosocomial infections. Inadequate lighting is linked to patient depression as well as medication errors by hospital staff. Designs that keep nurses away from the bedside—"hunting and gathering" needed supplies, as Ann Hendrich puts it—contribute to patient falls. Nurses often have to complete charting and fill medication orders in crowded, noisy, makeshift areas, which can lead to errors and increase staff burnout.

In addition, hospitals produce stress in a variety of ways. Excessive noise from paging systems, alarms, machines, and voices upset patients and distract staff. Feelings of helplessness and anxiety are triggered by poorly designed hospitals that force bedridden patients to stare at glaring ceiling lights and or are laid out in such a confusing way that visitors become lost in a maze of hallways. Double-occupancy rooms impinge on patients' privacy, disturb their rest, impede their recovery and prompt the majority of time-consuming, error-associated patient transfers. There may be few private places where patients can talk quietly with their families or with staff.

Ulrich and Zimring found that evidence-based design can improve hospital environments in three key ways:

- Enhance patient safety by reducing infection risk, injuries from falls, and medical errors.

- Eliminate environmental stressors, such as noise, that negatively affect outcomes and staff performance.
- Reduce stress and promote healing by making hospitals more pleasant, comfortable, and supportive for patients and staff alike.

They believe that the time is ripe for a thoughtful redesign of America's hospitals, which are in the throes of a major building boom. In the next decade, an estimated $200 billion will be spent on new hospital construction across the United States. "We have a tremendous opportunity, and it's an urgent one," said Ulrich.

Based on their review of the evidence, he and Zimring made the following recommendations:

- Provide all patients with private rooms that can be adjusted to address changing medical needs during their stays. This change alone will help improve patient safety by reducing patient transfers, cutting the risk of nosocomial infections, enhancing patient privacy, alleviating stress for patients and their families, and improving staff communication with patients.

- Improve indoor air quality with well-designed ventilation systems and air filters to prevent nosocomial infection. Several studies have demonstrated that identifying and fixing air-quality problems, in combination with single rooms and scrupulous hand-washing, can substantially lower infection rates at hospitals. Maintaining good air quality involves careful design, location, and control of ventilation components.

- Increase opportunities for cleaning hands. Clean hands are key to preventing nosocomial infection. Hand-washing and disinfectant stations should be placed at key locations inside patient rooms.

- Make hospitals quieter. Sound-absorbing ceiling tiles and carpeting can reduce noise, which will lower stress for patients and staff alike.

- Provide better lighting and access to natural light to reduce stress and improve patient safety. Exposure to daylight and nature views can improve patient outcomes, by reducing depression, agitation and need for pain medications, and by encouraging sleep and normal circadian rest-activity rhythms. Poor lighting also contributes to medication errors.

- Create pleasant, comfortable, and informative environments to relieve stress and promote satisfaction among patients, their families, and staff. Minor changes to room layouts, color schemes, furniture choice and arrangement, floor coverings and curtains, as well as providing informational material and displays, can improve people's moods and physiological states. In addition, several studies have shown that views of nature and gardens can effectively reduce stress and alleviate pain through pleasant distraction.

- Make hospitals easier for patients and their families to navigate. It's easy to get lost or confused while trying to find one's way in a large medical center. This confusion is stressful, and incurs a cost to the hospital in staff time spent direction-giving (at one major tertiary care hospital, staff other than those whose responsibility was direction-giving spent more than 4,500 hours a year helping people find their way). Good wayfinding systems include mail-out maps and written directions, you-are-here maps and directories at key entries, directional signage at decision points, reassurance signs for long paths, and clear identification of rooms.

The Business Case for Building Evidence-Based Hospitals

Building better hospitals not only makes sense from a health care perspective, it's good business sense. Smarter hospital design can pay for itself within a year by improving service efficiency, patient safety and satisfaction, and market share, according to Berry and Derek Parker, director at Anshen + Allen Architects, San Francisco.

"Caring for sick people in the hospital is the most stressful work I've ever studied," said Berry. He believes that good design is critical to improving hospitals' ability to attract and retain skilled staff and to their productivity, quality of work life, and job satisfaction.

What is the up-front cost of building a better hospital, and how is that additional cost offset over time? To answer those questions, Berry and Parker invented "Fable Hospital," a 300-bed regional medical center on an urban site built at a cost of $240 million to replace a 50-year-old hospital. Berry and Parker modeled Fable – as well as its projected costs, savings, and revenues – on the experiences of the Pebble Project, a research effort between The Center for Health Design and selected hospitals to document specific elements of facility design that improve quality of care and financial performance.

Fable Hospital's core values include quality, safety, patient-focused care, support for family members and staff, efficiency, and community responsibility. The hospital's design reflects those values. All patient rooms at Fable are private, oversized, and acuity-adaptable, so that they can accommodate a wide variety of patient conditions, needs, equipment, and staffing during changing stages of illness and recovery.

These and a myriad of other innovative design features collectively added $12 million to Fable's construction costs. But these costs were recouped within a year, thanks to $7.8 million in savings from reduced patient falls, transfers, nosocomial infections, nurse turnover, and drug costs; as well as nearly $3.7 million in increased market share and philanthropy. If Fable invests its savings at 3 percent for 30 years, it will have an additional $12 million, Parker said.

However Don Nielsen, M.D., senior vice president for quality leadership at the American Hospital Association (AHA), suggested that making the business case for improved hospital design may be more complicated. Access to capital for construction projects is limited, he noted. Most hospital officials do not have the option of a 12-month turnaround on costs; they may have only three to six months.

"You can make a business case for quality for the health care system [as a whole]," he said. "The payoff for the individual hospital is open to question."

And yet, according to Parker, hospitals that don't build "smart" ultimately will pay a different – and far higher – price. "We would say that [those hospitals] won't be competitive. They won't be in business."

Designing the Mind of the 21st Century Hospital

How does a hospital accomplish its work? Does it use standardized care protocols and administrative forms? Do multidisciplinary teams work with patients to plan and provide care? Are patients truly at the center of care?

"Every hospital would say that it is patient-focused and patient-centered," said Pat Rutherford, R.N., vice president of the Institute for Healthcare Improvement (IHI) in Boston. "But how many could say that the patient is in control of his or her experiences in the hospital?"

Very few.

Rutherford believes that patient-centeredness is the key to improving work design and processes at hospitals – what the Foundation thinks of as the "mind" in its mind-body-spirit model. "We treat [patients] as guests," said Rutherford. "I think the paradigm should be flipped. We are the guest in the patients' and families' lives in their episode of illness."

Transforming Care at the Bedside, a national initiative led by IHI in partnership with the Foundation and a handful of progressive hospitals, is addressing fundamental health quality issues by mobilizing teams of frontline workers to improve the ways in which hospitals do their work. These hospitals are serving as laboratories of learning, where improved practices are brainstormed and tested.

For example, at Kaiser Foundation Hospital in Roseville, Calif., night-shift nurses and physicians make quick rounds before the shift begins to check on patients and anticipate and prevent problems that might come up during that night. The strategy has nearly eliminated pages to physicians covering the shift. Seton Northwest Hospital in Austin, Tex., persuaded 13 gynecological surgeons admitting post-op patients to use a single unified physician order form – instead of 13 different forms– saving time and energy and improving care.

At the conference, Rutherford stressed the need to create systems of learning so that hospitals could continuously pursue innovative interventions and share best practices for improving care. She cited the 10 rules for redesign of care delivery articulated in *Crossing the Quality Chasm*, the IOM's 2001 report, as guiding principles for improving hospital care:

1. Care is based on continuous healing relationships.
2. Care is customized according to patient needs and values.
3. The patient is the source of control.
4. Knowledge is shared and information flows freely.
5. Decision-making is based on evidence.
6. Safety is a system property – not a project.
7. Transparency is key.

8. Needs are anticipated.
9. Waste is decreased continuously.
10. Clinicians cooperate with each other.

These rules may appear simple, but they reflect a need for dramatic system-level redesign – literally re-thinking the way that hospitals work. That kind of progressive thinking can achieve major results. In the ideal 21st century hospital, Rutherford said, there would be no needless deaths, pain and suffering, delays in care, helplessness, or waste. She provided the following examples to illustrate how these goals can be achieved.

No needless deaths. At Tallahassee Memorial Hospital in Florida, the creation of a rapid-response team allowed frontline nurses in a medical-surgical unit to obtain immediate assistance when a patient's condition began to deteriorate. The number of unexpected deaths on the unit fell, while staff morale improved.

No needless pain or suffering. Luther Midelfort (Mayo Health System) in Eau Claire, Wis., standardized warfarin administration using nurse-run protocols and reduced adverse events from anticoagulants by 53 percent. Warfarin complications requiring hospitalization fell 54 percent, and hospitalization costs related to warfarin were reduced by $1.5 million per year.

No unwanted waiting. This means providing the right care at the right time in the right place for the right patients. A group of 50 hospitals is working with system engineers and architects to relieve bottlenecks in patient flow caused by peaks in elective surgeries.

No needless helplessness. Patients should be part of the decision-making process. Some hospitals in the *Transforming Care at the Bedside* initiative are experimenting with multidisciplinary teams that make rounds in patient rooms and use white boards to plan each patient's day, based on the patient's goals. Patient satisfaction has soared.

No waste. This goal can speak to the "body" of the hospital – its physical layout and infrastructure, such as acuity-adaptable units that can be adjusted to meet patients' needs as they change during their stays. Or it can speak to the "mind"—the systems that generate excessive and redundant paperwork, for example. By optimizing both teamwork and its work environment, Hackensack (N.J.) University Medical Center reduced its nursing turnover to 6.7 percent and saved $26 million from a $150 million budget in 2002.

Hospitals committed to improving care and work processes must constantly question their operational procedures, and attempt to discover, cultivate, and demonstrate the feasibility of new and more capable work designs. *Transforming Care at the Bedside* is helping hospitals move along that path to innovation and improvement.

The Spirit: Culture as an Instrument of Healing

Hospital environments can be very dispiriting. They create stress and feelings of isolation and helplessness among patients, staff, and visitors alike.

"I've heard too many stories from patients who say, 'I felt like I was on an assembly line. Nobody knew what I was about, and I had nobody to talk to,'" said Robin Orr, president of The Robin Orr Group in Santa Barbara, Calif.

Hospital staff often feels emotionally and spiritually depleted, too. Orr said that one nurse told her, "I felt like an IV pole that just gets moved from one room to another." In a recent survey of health care workers, 75 percent said they believed that quality of care at their facility had declined in the last two years, 50 percent were exhausted and discouraged when they left work, and 40 percent felt powerless to effect changes necessary for improving care. Such perceptions contribute to high staff turnover.

And yet, it doesn't have to be that way. A hospital that embodies a positive spirit can inspire and motivate people. It can help patients heal and support its staff, who are performing some of the toughest and most demanding jobs imaginable, while providing needed assistance to visitors.

Like other presenters, Orr, the first director of the Planetree organization, said that it all comes back to focusing on the patient. "The IOM said it best: Creating a system that has the patient at its core is paramount. The patient's voice should be constantly heard."

In patient-focused hospitals, the culture promotes caring and healing, and that culture is reflected in everything the hospital does – from providing services to communicating with patients to keeping administrative records – and even in how it is designed. Orr noted that such hospitals value creativity and continuous teaching and learning, both formally and informally, and among all staff. Cosmetic changes, such as better lighting, use of artwork, and well-designed ceilings and floors, can make a big difference, but change must be more than cosmetic. It must reflect the inner culture of the organization.

Healing values that should be reinforced and supported through better architectural design include:

- Renewal and contemplation
- A sense of health and wellness
- Transparency and open communication
- Social interaction and support
- Hope and optimism

At Redwood Memorial Hospital, a small hospital in northern California, a cultural design team has been recruited to identify ways to improve the spirit component of their facility.

Orr described this as a deliberate, dynamic process – a “journey of discovery and inspiration.”

Learning from other hospitals is helpful, Orr said, but it is equally important to look for lessons from non-health organizations. Among the questions that hospitals should ask themselves:

- How well do we communicate the idea that people are our most important asset?
- How much time do we spend analyzing data instead of taking action?
- How do we use data to inspire greatness?
- How do we reach out to our communities and open our doors to complementary medicine practices?
- Are we easy to do business with?
- Do we have service standards that clearly define the behavior that we expect of others and of ourselves?

“It all starts with leadership – not safe leadership, but leadership that can inspire hearts and minds,” Orr said.

From Vision to Reality: The Story of Bronson Methodist Hospital

The redevelopment of Bronson Methodist Hospital in Kalamazoo, Mich., illustrates how a holistic approach to hospital redesign – one that incorporates mind, body, and spirit – can work. Although the most obvious changes at Bronson are physical – a new $181 million replacement facility on 14 acres in downtown Kalamazoo opened in 2000 – the transformation of Bronson runs much deeper than its physical appearance and infrastructure.

In 1992, when the hospital officials began to consider the possibility of renovating, they didn't have a body of research to guide them. "But we did have a very strong vision of what the hospital of the future should be and a very strong commitment to doing what was right for the patient," said Frank J. Sardone, president and CEO of Bronson Healthcare Group. That vision consisted of:

- Transforming the organization's culture and inspiring staff
- Creating a healing environment
- Enhancing customer experience
- Improving performance

"This was more than a bricks-and-mortar process," Sardone said. "We had a bigger idea." The rebuilding process provided an ideal opportunity to engage all staff in focusing on the hospital's spirit and to figure out ways of improving both care and organizational culture.

Hospital leaders believed that it was important to prepare staff for the upcoming changes, to include them in implementing those changes, and to reassure them, recognizing that change can be intimidating. So, a change management course was implemented. In addition, several celebrations were held during the renovation in an effort to provide positive reinforcement for staff and maintain their support for the process. For instance, a lively fashion show featuring hospital staff was used to introduce newly designed staff uniforms, dubbed the "Bronson collection." Over time, employee satisfaction improved significantly. Annual nurse turnover fell from 16.7 percent to just 6.5 percent, which freed up resources that could be used for other areas of importance.

The second component of the rebuilding project involved creation of a healing environment. Art, light, and nature – including a central garden atrium – are integrated throughout the facility to create a pleasant environment. Additional improvements include shortened walking routes for patients and families, with seating dispersed along the way, and touch-screen information kiosks at every main entrance to improve wayfinding for visitors.

All patient rooms are private, with sleepover accommodations for visitors and hand-washing stations located right by the door. "Private rooms are really a home run for us," Sardone said. "They're good for everybody." Patients have more privacy, they can

interact more freely with family members and friends, and it is easier for them to rest without disturbances. Nosocomial infections have fallen 11 percent, and patient transfers – which used to cost the hospital $500,000 a year – have been reduced as well. The structural improvements are reflected in patient satisfaction rates, which exceed 96 percent. "We want patients to feel delighted" with their experience at Bronson, Sardone said. The idea is to "exceed patient expectations."

Bronson has also focused considerable attention on work process and performance – the "mind" part of the equation. Responding to the IOM's call for systemization, the hospital has standardized much of its equipment and work processes. Staff uses wireless communication on inpatient floors. Additional technology – such as pharmacy robots and bedside barcoding – has helped prevent errors and improve patient outcomes. Medical staff also perceives that overall quality of care at Bronson has improved.

Largely as a result of these and other efforts, Bronson has become the hospital of choice in its market; in fact, market share has increased 6 percent. The hospital has also been recognized as one of the nation's best places to work.

The hospital continues to explore opportunities for improvement. For example, Bronson is working closely with The Center for Health Design to study work flow and processes post-construction. A study of the impact of design decisions on organizational culture has just been completed, and the hospital is pursuing strategies to reduce noise.

Bronson may be the closest real-life cousin to Berry's and Parker's Fable Hospital, in terms of its holistic approach to transforming not just its "body" but its "mind" and "spirit" as well. Will that success endure? What will it look like in the future? "I need to hear back from Bronson in a year, five years, or 10 years," said James B. Atkinson, M.D., professor and chief of pediatric surgery and general surgery at UCLA Medical Center.

Looking Ahead

Because of the tremendous hospital building boom now under way, this is the ideal time to reinvent America's hospital infrastructure. Meeting participants identified audiences that need to be educated about the potential for using evidence-based design to improve hospital performance across so many dimensions. Those audiences include: hospital CEOs who are contemplating major construction projects, hospital governance boards, organized medicine, health care purchasers and payers, Medicare quality improvement organizations, state-level code regulators with jurisdiction over hospitals, construction bonding entities, architects who design hospitals, educators in the health care architecture field, patient advocates, and community leaders.

Meeting participants also identified a number of challenges to making the hospital of the 21st century a reality, including the following:

- Constant Change. Today's hospitals are in a state of nearly continuous flux with respect to their work, the composition of their workforce, the technologies and medicines they use, and new challenges, such as biopreparedness. "My message to architects is that I want a hospital that I can change, that's flexible," said Laurence Wellikson, M.D., executive director of the Society for Hospital Medicine.

- Politics. "We can look at what the Fable Hospital should be, but the design of any hospital is a political process," said Atkinson of UCLA. "A university hospital has 7,000 constituencies, and the end product is never going to be ideal."

- Buy-In. "If organizations don't own this in the end, it's not going to happen," said Dennis O'Leary, M.D., president of the Joint Commission on the Accreditation of Healthcare Organizations. AHA's Neilsen agreed. "This is not a project. It's a manifestation of a specific strategy – patient-centered care – and … it must be embraced by the organization."

- Training and Awareness. Professionals in both the architecture and the hospital industries need to know about new research on evidence-based design and its relationship with quality of care and institutional culture. Most hospital CEOs will rebuild only once in their careers – therefore they will have little to no firsthand experience with reconstruction. Thought should be given to developing tools that hospital executives and others can use to successfully plan and build evidence-based facilities.

- Regulatory Constraints. Hospitals are subject to regulation by multiple governmental entities, sometimes militating against ideal design. The state of Illinois, for example, "limits the size of single-occupancy rooms to the point that they're not functional," said Roger Lieb.

- Cost Pressures. Ann Adams, project director for Catholic Health Initiatives, pointed out that financing the extra costs required for building a hospital using evidence-based design principles could be an insurmountable barrier – particularly among cash-strapped rural facilities.

- Payer Involvement. Will public and private insurers support an ideal model for America's hospitals? Jane Rohde, of the International Interior Design Association, noted that in some cases, waivers may be needed from Medicare or Medicaid to make these changes possible. "Payers need to be at this table," she said.

Participants agreed on the importance of developing strong messages about the interrelationship of patient safety, quality of care, and good hospital design, as well as the business case for better design. These messages must be communicated effectively to key audiences. "The power of design is its power as an enabler of patient-centered care," commented AHA's Neilsen. "We shouldn't portray this as an isolated project without linkage to an overall strategy."

Zimring recounted his mother's stressful experience several years ago when she was admitted to a well known hospital in the Midwest with pain and paralysis in her hands and feet. "The quality of care that my mother received was in spite of the physical environment – not because of it," he said. Yet, design elements that make hospitals more dangerous and more stressful are being replicated in hospitals under construction today.

That has to change.

"We are not advocating 'fancy,'" Berry said. "We are not advocating luxury. We are not advocating Ritz-Carltons. This is about building better hospitals – safer hospitals, more efficient hospitals, more human hospitals."