Transforming Hospitals:
Designing for Safety and Quality

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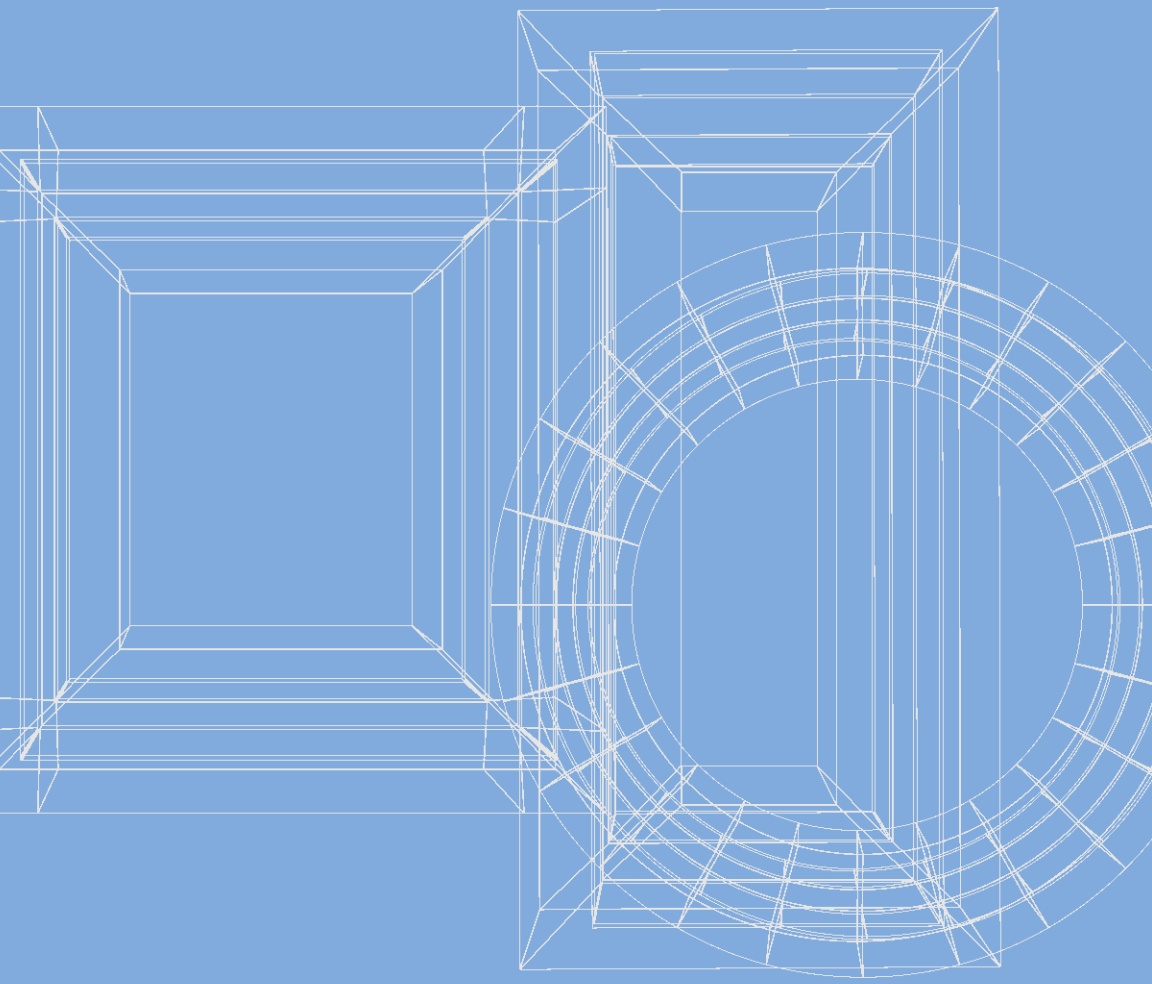

Background

The 1999 Institute of Medicine's landmark report, *To Err is Human: Building a Safer Health System*, exposed the tremendous costs, both in human and financial terms, of medical errors in the U.S. health care system.[1] Two studies cited in the report indicate that between 44,000 and 98,000 people die each year in the United States as a result of medical errors. The national cost to the economy of these errors is between $17 billion and $29 billion. Since the release of the Institute of Medicine's report, a number of successful initiatives have been launched to help hospitals change their cultures and care processes to produce safer health care environments with fewer medical errors.

A growing body of literature describes the link between a hospital's physical design and its key quality and safety outcomes. Hospital planners, expected to spend nearly $250 billion on new construction in the next 10 years, are consulting this evidence and incorporating it into their designs for capital construction projects.[2] In the midst of this construction boom, hospital planners have an opportunity to create safer and more effective facilities that enhance patient safety, improve the quality of care, increase workforce satisfaction, and reduce the cost of care.[3] In an era of staff shortages, increased transparency of information about hospital performance, and reimbursement linked to performance, improving health care environments may be critical to a hospital's survival.

Transforming Hospitals: Designing for Safety and Quality, a DVD from the Agency for Healthcare Research and Quality (AHRQ), reviews the case for evidence-based hospital design and how it increases patient and staff satisfaction and safety, quality of care, and employee retention, and results in a positive return on investment. The DVD presents the experiences of three model hospitals—Griffin Hospital in Derby, CT; Holy Cross Hospital in Silver Spring, MD; and Woodwinds Health Campus in Woodbury, MN—that incorporated evidence-based design elements into their construction and renovation projects. Hospital executives planning or executing a major capital construction project or minor renovations can use the information presented in this DVD to help identify how evidence-based design can improve the quality and safety of their hospitals' services.

Evidence-Based Design

Evidence-based design is a term used to describe how the physical design of health care environments affects patients and staff.[4,5] Key characteristics of evidence-based design in hospital settings include single-patient rooms, use of noise-reducing construction materials, easily accessible workstations, and improved layout for patients and staff.[6]

Patient Safety

Evidence-based design elements can help hospitals reduce costly and avoidable incidents of patient harm, such as patient falls, hospital-acquired infections, and medication errors.

Patient falls. Patient falls, which are common in hospitals, can result in serious injuries, extend a patient's stay, and drive up the cost of care significantly. By 2020 the estimated annual cost of fall injuries for older people will exceed $30 billion.[7,8] Now that the Centers for Medicare and Medicaid Services no longer reimburse hospitals for the cost of patient falls that occur in their facilities, and insurers are likely to follow its lead, hospitals will bear a greater portion of this cost.

Patient falls can be avoided. Poor placement of handrails and small door openings are two primary causes of patient falls. Many falls can be reduced through providing well-designed patient rooms and bathrooms and creating decentralized nurses' stations that allow nurses easier access to at-risk patients.[9,10,11]

Hospital-acquired infections. Single-bed rooms and improved air filtration systems can reduce the transmission of hospital-acquired infections. Infections can also be reduced by providing multiple locations for staff members to wash their hands so they spend less time walking to sinks and have more opportunities to sanitize their hands before providing care.[12]

Medication errors. Poor lighting, frequent interruptions and distractions, and inadequate private space can complicate filling prescriptions. Well-illuminated, quiet, private spaces allow pharmacists to fill prescriptions without the distractions that may lead to medication errors.[13]

Patient rooms that can be adapted for the acuity of a patient can also reduce errors. Acuity-adaptable rooms reduce the need to transfer patients around the hospital and lessen the burden on the staff to communicate information to caregivers in the patient's new location.[14]

Patient Satisfaction

Reducing noise, providing more privacy, and making it easier for patients to find their way though the hospital can all improve patient satisfaction.

Frequent overhead announcements, pagers, alarms, and noisy equipment in or near patient rooms are stressful for patients and interfere with their rest and recovery.[15] Single-bed rooms with high-performance, sound-absorbing ceilings and limited overhead announcements can substantially improve the healing environment for patients.[16]

Evidence also shows that patients are more satisfied with their care when they are given adequate space to interact with their families. For example, single-patient rooms make it easier for families to stay with patients.[17] Responding to the overwhelming evidence regarding how single-patient rooms improve patient safety, satisfaction, and quality outcomes, the American Institute of Architecture changed its 2006 construction guidelines to recommend that single rooms for medical, surgical, and postpartum nursing units in general hospitals be the standard.[18,19]

Helping patients effortlessly find their way through hospitals can improve patients' overall care experience and increase satisfaction by reducing feelings of stress, anxiety, and helplessness for them and their families. Better navigation can be addressed architecturally through useful signage and easily navigable corridors.[20]

Quality Outcomes

Several design elements are associated with better quality outcomes for patients. In addition to improving patient satisfaction, reducing hospital noise can improve patient recovery and sleep time and reduce depression. Other factors, such as increased sunlight in patient rooms, views of nature, artwork, and music, also reduce patient stress and can lead to improved outcomes.[21]

Staff Satisfaction and Workforce Retention

Staff shortages and turnover are serious problems for hospitals. The average annual turnover rate for health care workers, many of whom are nurses, is 20 percent, and much of this turnover is related to stress, which could be greatly reduced by lessening the physical demands of nursing.[22,23]

One example of how to reduce the physical burden on staff and improve workflow is by using acuity-adaptable rooms, which limit the need to transfer patients within the hospital. By reducing the number of moves, hospitals can increase productivity in delivering patient care and decrease the physical demands on the staff.[24,25]

Another useful design element decentralizes nurses' stations and supply areas to allow nurses to spend less time walking and more time treating patients.[26] Reducing stressful noise; improving light sources for surgical staff; and designing patient beds to reduce back stress, fatigue, and injuries can also improve workforce satisfaction and retention.[27]

Cost Effectiveness

The competitive nature of health care, new medical technology that requires facility upgrades, and the need for health organizations to become more efficient and cost effective have driven the recent upward trend in hospital growth. To meet these challenges, hospitals require frequent updates to meet current guidelines and regulations and maintain market share.[28]

Although designing an updated facility using evidence-based design principles may add up-front capital costs, this investment ultimately decreases medical and financial complications that can result from a poorly designed facility.[29,30,31] The Center for Health Design modeled and analyzed the increased capital costs and downstream cost-savings of well-designed facilities by using a "fable hospital" that included many common evidence-based design elements. While these features added $12 million to the cost of the hospital construction, those costs were projected to be recovered in one year through operational savings and increased revenue.[32]

For More Information

For more information on *Transforming Hospitals: Designing for Safety and Quality* or AHRQ's research in evidence-based design, please visit the AHRQ Web site:

www.ahrq.gov/qual/transform.htm.

You can also contact AHRQ at:

AHRQ Office of Public Affairs
Ellen Crown, 301-427-1258

Resources on Evidence-Based Design

The American Institute of Architects: **www.aia.org**, especially *Guidelines for Design and Construction of Health Care Facilities*

The Center for Health Design: **www.healthdesign.org**, especially *The Role of the Physical Environment in the Hospital of the 21st Century*

InformeDesign: **www.informedesign.umn.edu**

Institute for Healthcare Improvement: **www.ihi.org**.

Planetree: **www.planetree.org**, especially *Designing and Practicing Patient-Centered Care*

Robert Wood Johnson Foundation: **www.rwjf.org**

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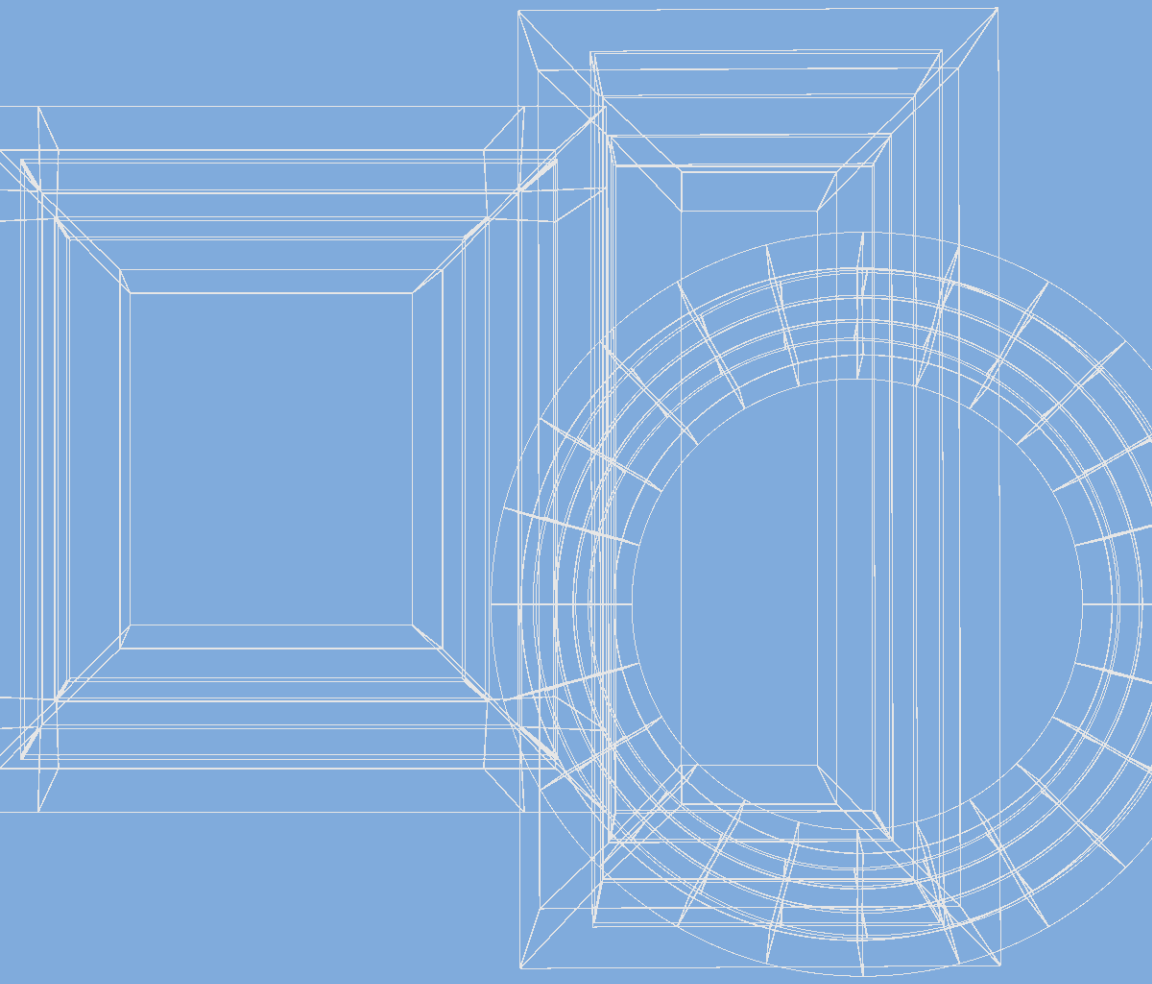

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