



Patient Rooms: A Changing Scene of Healing. The hospital is still the place where patients and their families, caregivers, and administrators come together for the common purpose of restoring a patient to good health. The issues each of these parties face all come into sharp focus in the patient room. It is there that the delivery of care is undergoing more change than at any other point in history.

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Healthcare in the U.S. is undergoing revolutionary change—in the ways it is delivered and funded, in the comparison-shopping approach many patients are taking, and in the ways healthcare organizations are responding. Healthcare practitioners and policy makers alike understand the gravity of the changes underway; they are equally concerned about how constant, accelerating change complicates dealing with it.

Change affects all areas of healthcare organizations, and none more so than the patient room. It is there that the issues faced by the major players in healing environments—administrator, caregiver, family member, and, most importantly, the patient—all come into sharp focus.

To learn more about the most pressing issues related to patient rooms, Herman Miller interviewed over 550 architects, designers, and hospital staff members. Respondents said advancing technology, infection control, patient and family experience, and caregiver efficiency were their top areas of concern. Here is a discussion of those concerns from the viewpoint of the major players involved.

Hospital Administrators: Staying Competitive, Delivering Quality Care

Those who run healthcare organizations are dealing with new and complex business realities. They are under enormous pressure to reduce costs, improve quality, be environmentally responsible in materials and processes, and respond to the marketplace. In the past, a hospital could rely on its location for a stable client base. Now, patients have new ways to evaluate alternatives.

The U.S. Department of Health and Human Services and Medicare created a database-driven tool called Hospital Compare¹ that allows anyone to see which hospitals get the highest and lowest satisfaction ratings from former patients on everything from communication with doctors and nurses to room cleanliness and pain control. The government and the public are demanding transparency on other things as well, including pricing and safety.

Furthermore, in a weak economy, people may put off even necessary surgeries and treatments, and fewer of those who do seek treatment are able to pay their share. Because they can't afford an appointment with their doctor, people procrastinate on getting treatment for non-life threatening conditions, such as a sinus infection. When the infection worsens instead of clearing up on its own, people go to the emergency room, knowing the hospital can't turn them away even if they can't pay. The cost of uncompensated care was \$36.4 billion in 2008.²

Demographics could be a bright spot. According to the Census Bureau, between now and 2050, the number of people over 65 will double,³ and this group makes up the largest market segment (37.5 percent) in healthcare.⁴ Hospitals don't make money from Medicare or Medicaid, however, so they rely on private payers to make up the difference. Most often that means profits come from customers undergoing elective surgery, and hospitals are working hard to attract those patients.

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They do that in part through patient-centered care—everything from new technologies that speed ease and delivery of care to comfortable, attractive patient rooms that are functional for the patient, the patient's family members, and the staff.

Integrating new technology in patient rooms

New technologies are changing the landscape of the hospital in several ways. First, advances in technology are turning procedures that used to require hospital stays into ones that can be done on an outpatient basis. Nationally, 63 percent of all surgeries in 2005 did not require an overnight hospital stay and were considered outpatient, compared with 51 percent in 1990 and only 16 percent in 1980.⁵ That trend is likely to continue. Post-procedure bedside monitoring can be done remotely with two-way video cameras and biosensors that send data from the patient's body to the doctor.⁶ Since these patients will no longer need to actually be in the hospital to receive care, hospital facilities will serve primarily patients who need acute care.⁷

Hospitals are already building new or renovating existing facilities so they can accommodate new technologies, patient demands, an aging population, and new patterns of care. New facilities can cost \$1.5 to \$2 million per bed, and renovations can be just as costly when modernization and downtime are factored in.⁸ With that kind of money involved, patient rooms that are adaptable are a good solution. In one survey of hospital administrators and designers, 75 percent of respondents said that reconfigurable casework is a benefit because of the flexibility and ease of reconfiguration in the patient environment.⁹

The second way technology is changing the landscape in hospitals is that more technology is making its way into the patient rooms. There is patient handling and movement equipment that helps nurses lift and move patients, for example. Bedside diagnostic tools are getting more sophisticated all the time. Soon, patient rooms might also have to accommodate videoconferencing technology, so a specialist located in another part of the country or the world can be "called in" for a consult.

Computer physician order entry (CPOE) systems that electronically send a doctor's orders for a test, medication, or procedure for a patient to other parts of the hospital are becoming standard. Those systems are accessed through computer workstations. Some are on wheeled carts; some are attached to telescoping platforms mounted on walls at the bedside; still others are accessed at decentralized or centralized work areas. CPOEs relate to the most significant pressure on the technology front: electronic medical records or EMRs. They include everything related to a patient's care—doctors' notes, diagnostic reports, records of prior hospitalizations. Because EMRs speed up care, prevent duplication of tests, and result in better care (doctors can see, for example, if a patient has had an adverse reaction to a medication), they are most hospitals' top technology priority. Only about 12 percent of hospitals currently have EMR systems.

Recent stimulus funding includes incentives for physicians who have implemented EMR into their practices by 2015. Incentives will be paid in the form of Medicare and Medicaid reimbursements, in addition to grant programs. But, providers who have not

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implemented EMR by 2015 will be penalized with up to 3 percent decreases in Medicare/Medicaid reimbursements.

Implementing medical technologies, such as EMRs, is that much more difficult because they are advancing so rapidly (some say there’s an 18-month “churn to obsolescence”) that even a hospital considered state of the art while being built might not be by the time the project is finished.¹⁰ How can hospitals build patient rooms now that will accommodate technological tools and treatments that don’t yet exist? The best answer, says Steven Yundt, planning principal with CO Architects in Los Angeles, may be to “...plan in flexibility, so that over time systems and devices can be accommodated in a strategic manner.”¹¹

Keeping patient rooms infection free

Administrators have the same goal as the other key participants in a hospital setting: returning a patient to good health. A key part of that goal is to avoid a hospital-acquired infection (HAI). But because patients already have compromised immune systems and staff members work with multiple patients over the course of a shift, it still happens. Back in 1999, members of the medical community were alarmed when they learned that up to 98,000 patients were dying each year as a result of hospital medical errors and HAIs.¹² Since then, hospitals have focused on quality improvement, particularly controlling infections.

The germs that can cause infections can live on surfaces for months, and they can be spread either when the patient touches that surface or when a caregiver touches the surface and then touches the patient. While in theory it might take 30 to 60 minutes to thoroughly clean a patient room, the staff might have only eight minutes to actually clean it before a new patient arrives in the room. Hospitals are often short on staff in all areas, including housekeeping.

With so much at stake, hospitals are addressing the problem in multiple ways. One way to compensate for less staff is to install furnishings designed for easy cleaning, e.g., surfaces without crevices. There are robots that spray a fine mist that disinfects the entire room and surveillance software that identifies an infection trend on a patient floor so corrective action can be taken quickly. Some hospitals use an invisible “goo” to test how effective the cleaning crews have been at wiping out bacteria. Spots the crew miss show up under a black light. Simply sharing results with the crew and giving them additional training can increase effectiveness. In one case, doing so almost doubled the effectiveness.¹³

Microfiber mops and cloths, which can hold six times their weight in water and have a positive charge that attracts dirt, cut down on cross contamination when compared to cotton-loop mops, which need to be “redunked” in mop water frequently.¹⁴ While paint, fabric, carpet, and countertops enhanced with antimicrobial properties that kill germs on contact sound promising, so far no such products been approved or registered by the Environmental Protection Agency, which requires data to back up claims.¹⁵

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Simple and obvious tactics are also effective. For example, research shows that private rooms can help reduce the spread of infections.¹⁶ Hand washing is one of the best ways to prevent infections; unfortunately even healthcare professionals who know the importance of doing it don't always make time for it: one study reports that 60 percent of healthcare workers don't.¹⁷

Installing alcohol-based sanitizer dispensers throughout a hospital leads to markedly improved hand hygiene, perhaps because they are convenient and take less time than hand-washing. Here, too, design matters. Something as simple as sink placement makes a difference. Deep, splash-free sinks ideally should be located near the door and at least three feet away from the patient.¹⁸ In addition, separating wet areas from dry surfaces and installing fixtures and furnishings that have "roll off" edges so water doesn't get trapped can aid in infection control.¹⁹ Checklists have also been a very effective way to reduce infections.²⁰

Sharing performance data helps doctors do their jobs better, just as it does cleaning crews. One hospital administrator in Florida posts "infection rate" lists every year. The surgeons are identified by code, not by name, but surgeons know where they rank. "They growl a bit, but then they find their way to my office and ask, 'Why am I in the bottom third of this list?' It's a very, very powerful tool," Dr. Stephen Streed, director of epidemiology at Lee Memorial Health System in Florida, told the Wall Street Journal.²¹ States are using a similar approach, with many passing laws requiring that hospitals make public their common infection rates so patients can easily do their own research.

Caregivers: Greater Efficiency for Better Caregiving

To a patient, the nurse is the face of the hospital, the person who most directly affects a patient's experience. Changes in both the process of caregiving and the layout of patient areas have taken a toll on nurses. They are being asked to do more with less: In a recent survey, 67 percent of nurses said their workload has increased over the last six months.²² Forty percent of nurses work shifts that last more than 12 hours. And the very technologies that make a patient's life easier and improve information sharing among staff require extra training and effort for already overworked nurses.

The layout of the patient room, while no panacea, can have a dramatic effect on a nurse's efficiency.

The layout of the patient room, while no panacea, can have a dramatic effect on a nurse's efficiency. Locating a hand-washing station so it is in the natural flow of entering and exiting a room can increase its use. Providing surface space close to the bed for setting down supplies, equipment, or charts keeps these items close at hand. Placing furniture and equipment so that there is always room to work next to the bed and close to the patient reduces frustration.

Supplies should be close at hand and clearly labeled. Consistent organization and placement of supplies allow caregivers to reach for and find materials without thinking about it. Doing so can eliminate the "squirreling away" of supplies. This hoarding "typically happens because caregivers lack confidence that they'll have what they need when they need it," says Kerrie Cardon, Knowledge Marketing & Design Facilitation

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Lead at Herman Miller and a registered nurse and architect. But it isn't an efficient or purposeful use of space.²³

When it comes to dispensing medications more efficiently, some hospitals are moving from Pyxis-type units on each floor to locked, in-room dispensers (stocked by a pharmacy technician) that can be accessed only by authorized staff. Keeping commonly needed items like IV poles, pumps, and commodes in every room saves hunting and gathering time and “turn” time (between when the patient is released and a new patient admitted) because the patient room and its equipment can be cleaned at the same time. Supplies that are decentralized in an organized, purposeful way also save time.

Improving the efficiency of caregivers is good for patients because higher efficiency leads to better care and lower cost of care. It's good for nurses, who get to spend more time on direct patient care and less time running around. That leads to higher job satisfaction, and nurses who have high rates of job satisfaction are less likely to leave—a huge consideration when the average cost to replace a full-time registered nurse is \$36,567.²⁴

Happy nurses are also engaged nurses. “Research shows that organizations in all industries that have a high level of engagement among their employees can outperform their competition by 20 percent,” Joseph Patrnczak, chief of human resources at Cleveland Clinic Health System told Trustee magazine. “In the service industry, research shows they can outperform their competition by as much as 30 percent.”²⁵

Furthermore, “job satisfaction [for nurses] has been shown to be a more important factor for patient satisfaction than nursing skill.”²⁶ A Commonwealth Fund study of the HCAHPS survey data found that “hospitals with more satisfied patients generally provided higher quality of care as measured by standard quality metrics.”²⁷

The Patient: There to Heal

The most important person in the patient room is the patient. Thanks to the Internet and social networking, patients are savvier than in the past. They may not know what HAI stands for, but they know they can get sick while at the hospital. A private room used to be considered a luxury; now patients expect it, along with other amenities like Wi-Fi and lots of windows.

In addition to being savvier, the people who do end up in the hospital are also sicker, since straightforward procedures are now done on an outpatient basis. Nothing is more important than safety in the hospital. An in-hospital fall is one of eight “never events” that the Centers for Medicare and Medicaid Services (CMS) decided in 2008 should never occur after admission and for which they will no longer reimburse—and the list of events continues to grow.

While no measure can guarantee a patient won't fall (one study suggests that 20 percent of patient falls can be prevented²⁸) there are things that can minimize the chances a patient will fall. These include a clear line of sight between staff and patient, bathrooms

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located at the head of the bed for easy access, and extra-wide bathroom doors, since most falls happen in doorways too narrow for both the caregiver and the patient.²⁹

While the patient needs a safe environment in order to heal, there are a number of factors beyond safety and good medical practices that contribute to healing.³⁰ Access to daylight has been found to reduce pain, depression, and length of stay as well as improve patient and staff satisfaction. Views of nature have been linked to reduced pain, reduced stress, and shorter length of stay.

Decreasing noise levels improves patient sleep and patient satisfaction, and it decreases stress for patient and staff alike. Conversely, too much noise raises blood pressure and raises the risk of medical errors because staff can't hear instructions. Single-patient rooms, single-handed rooms (which have fewer equipment-related cracks through which noise can leak), and noise-reducing finishes can all keep noise down so patients can rest and staff can concentrate. When given the choice, patients chose to watch a music channel with nature images over regular TV programming, preferring something calming.³¹

Patients who have a sense of control recover more quickly. "One of the worst things about being a patient is that you don't have control over what is happening to you or around you," says Doug Bazuin, Senior Researcher at Herman Miller. "Giving a patient some measure of control, even just easy access to their personal things, goes a long way toward improving a patient's experience." New electronic controls do that by allowing patients to open and close the blinds and adjust the temperature and the lighting.

Family Members: Providing Support, Learning to Treat

The role of family members has changed from concerned by-stander to member of the care team. Family members are now expected to be fully involved in the healing process. With these responsibilities has come additional access. Families now regularly stay in the patient's room around the clock. This is good for the patient's recovery but has implications for the staff and the facility.

Studies show that family involvement in caring for the patient results in better and faster healing.³² Family zones in the patient room result in fewer patient falls, reduced patient stress and depression, improved patient privacy and confidentiality, improved communication with patient and family members, improved social support, and increased patient satisfaction.³³ In newborn intensive-care units that encourage families to be present 24/7 and participate in care and treatment, premature babies experience less stress and better weight gain.³⁴

While Americans may think the practice novel, in Mexico, it's just expected that a family member will come along to the hospital and learn basic patient care.³⁵ It's part of the culture. As family members get more involved, they need the knowledge necessary to help the patient recover once the patient returns home. "We used to look at families and just see problems," Beverly Johnson, the president of the Institute for Family-Centered Care, told the Wall Street Journal. But hospitals now are looking less toward simply

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accommodating family members and more toward embracing and integrating them into the care team.

The design of patient rooms is starting to reflect that change of heart. More consideration is being given to the comfort and support of family members. Hospitals are providing not only a comfortable place for one or more family members to sleep but also lockable family storage space, Wi-Fi, and an area conducive to doing paper or computer work.

Design Considerations

Research points to a real link between hospital environments and patient outcomes. A review of the research literature on evidence-based healthcare design was completed in 2004 and again in 2008. The latter review noted that “the body of evidence has grown rapidly and substantially in recent years. . . .It is now widely recognized that well-designed physical settings play an important role in making hospitals less risky and stressful, promoting more healing for patients, and providing better places to work.”³⁶

As awareness of that link increases, more hospitals are using evidence-based design (EBD) as they renovate facilities or build new ones. EBD is simply “basing decisions about the built environment on credible research to achieve the best possible outcomes,” according to the Center for Health Design.³⁷ The Center’s Pebble Project, which consists of 50 healthcare providers and manufacturers committed to using the principles of EBD for their projects is one example. Another is the Military Health System, which is using EBD for its 70 hospitals serving 9.2 million people worldwide.

A recent survey conducted by the Center for Health Design studied healthcare architects, designers, consultants, and those in related professions. It found that more than 80 percent sometimes or regularly used design research to make their decisions.³⁸ The EBD features most frequently incorporated in patient rooms include single-bed patient rooms, highly visible hand-wash sinks, surfaces and finishes to reduce falls, and rooms with designated zones for patients, families, and clinicians.³⁹

The confluence of a growing understanding of the hospital environment as a factor in healthcare and a boom in hospital construction projects presents the healthcare industry with a unique opportunity to recreate the hospital to better meet the needs of patients, families, and caregivers. At the same time that they are implementing some of the features suggested by EBD, hospitals must also be able to accommodate changes they can’t foresee.

As hospitals address the challenges laid out here, it’s important for them to remember this: The physical design of a setting either facilitates or impedes the implementation [of the hospital’s response]. Designs that impede changes can lead to expensive renovation work during the life of a facility to premature obsolescence of a facility or, all too often, the development of a caregiving plan that is suboptimal because it is designed around the facility constraints. Moreover, the physical design of facilities

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could influence staff effectiveness. From the viewpoints of efficiency, staff, well-being, and life-cycle cost, it is essential that the built environment be infused with flexibility to different operational models over a facility's lifetime.⁴⁰

The Joint Commission has published some principles to guide design of hospitals. These principles include designing “flexibility into the building to allow for better adoption to the rapid cycle of innovation in medicine and technology.”⁴¹ Even relatively small changes such as changes in philosophy of medication distribution can have implications for the patient room.

Furthermore, large areas of a hospital can change in function over time, from a cardiac focus, for example, to an orthopedic focus, and that has implications for patient rooms. This shuffling, which is common, allows “the best fit between services and physical units.”⁴² And standardization of the patient rooms and the support core is the key to unit interchangeability.⁴³

Thoughtful design of patient rooms can make a caregiver's job easier and the work environment more appealing. When their design improves efficiency and allows the caregiver more time with the patient, it can make caregiving more rewarding. For family members, design can help encourage their participation in recovery, rather than be an obstacle to it. And for hospital administrators, good design lays the groundwork for accommodating change—whatever that change may be.

There's not much that's for certain in healthcare today. But researcher Doug Bazuin, who has studied all aspects of healthcare organizations over the past few years, says there is one thing you can count on: “The perfect patient room today, if there even is one, will not be the perfect patient room of tomorrow.”

Notes

- ¹ Hospital Compare was created through the efforts of the Centers for Medicare & Medicaid Services (CMS), the Department of Health and Human Services, and other members of the Hospital Quality Alliance: Improving Care Through Information (HQA). Data is pulled from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).
- ² American Hospital Association fact sheet, p. 4, November 2009, <<http://www.aha.org/aha/content/2009/pdf/O9uncompensatedcare.pdf>>.
- ³ <<http://www.census.gov/population/socdemo/statbriefs/agebrief.html>>.
- ⁴ IBISWorld Industry Report, October 1, 2009, p. 7.
- ⁵ National Center for Health Statistics. *Health, United States, 2007 with Chartbook on Trends in the Health of Americans*. Hyattsville, MD: 2008. These statistics include major and minor surgical procedures performed in inpatient operating suites, outpatient surgery suites, or procedure rooms within an outpatient care facility.
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- ⁷ “How Technology will Reshape Clinical Care,” Molly Joel Coye, *Hospitals and Health Networks*, May 2007.
- ⁸ “Renovate or build new: The right prescription,” by Kurtis A. Young, Curtis M. Skolnick, and Ethan Sims, *Healthcare Design*, September 2008, p. 64.
- ⁹ Green Patient Lab 3.0, Anshen + Allen, 2009, p. 12.

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- ¹¹ *Ibid.*
- ¹² 1999 Institute of Medicine (IOM) study, which was followed by the 100,000 Lives Campaign, aimed at reducing the number of deaths.
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- ¹⁵ "The built environment as a risk factor for infection," Jain Malkin, an excerpt from *A Visual Reference for Evidence-Based Design in Healthcare Design*, July 2008, p. 40.
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- ¹⁷ "Hand washing: Time well spent," Manoj Jain, *The Washington Post*, August 5, 2008, <<http://www.washingtonpost.com/wp-dyn/content/article/2008/08/01/AR2008080102591.html>>.
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- ²⁰ Atul Gawande, *The Checklist Manifesto* (New York: Macmillan Metropolitan Books, 2009).
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- ²³ *Ibid.*
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- ²⁶ "The Impact of Facility Improvements on Hospital Nurses," Leonard L. Berry, PhD, and Janet T. Parish, PhD, *Health Environments Research & Design Journal*, Winter 2008, p. 6.
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- ²⁸ <<http://www.healthleadersmedia.com/content/LED-242097/Researchers-Studying-Whether-New-Medicare-Rule-Will-Reduce-Inhospital-Falls.html>>.
- ²⁹ <<http://www.bdcnetwork.com/article/CA6707820.html?nid=2073>>.
- ³⁰ Herman Miller confidential document, based on HERD Journal, Spring 2008
- ³¹ Herman Miller research (Bazuin hospital notes, hospital #2).
- ³² "New hospital designs change with demands; Amenities create hotel-like ambience," Shannon Mortland, *Crain's Cleveland Business*, July 28, 2008.
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- ³⁸ "2009 Survey of Design Research in Healthcare Settings: The Use and Impact of Evidence-based Design," Ellen M. Taylor, October 2009, p. 4.
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- ⁴¹ The Joint Commission, 2008, as quoted by Herman Miller internal document.
- ⁴² "Inpatient Unit Flexibility: Design Characteristics of a Successful Flexible Unit," Debajyoti Pati, Tom Harvey, Carolyn Cason, *Environment and Behavior*, March 2008, p. 221.
- ⁴³ *Ibid.*

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