

May 19, 2009

Health Outcomes Driving New Hospital Design

By CAROL ANN CAMPBELL

The curtain between two hospital beds does not stop noise from the television set, offer privacy during sensitive conversations with doctors or stop germs from spreading. Yet in most of America's aging [hospitals](#) it is the only thing that separates strangers thrust together as roommates simply because both are ill.

But in many new hospitals and pavilions, these semiprivate rooms have vanished. Single-patient rooms are now viewed as an important element of high-quality health care.

The benefits of the single room emerged through evidence-based hospital design, a new field that guides health care construction. More than 1,500 studies have examined ways that design can reduce medical errors, infections and falls — and relieve patient stress.

American hospitals started 53 million square feet of new construction and major additions in 2008, according to a report by McGraw-Hill Construction, a company that tracks industry trends. Promoters of evidence-based design say that a building exerts a powerful force on the delivery of health care, and that the best new health centers are light-filled, quiet and easy to navigate.

"Some hospitals are taking evidence-based design seriously," said Roger Ulrich, director of the Center for Health Systems and Design at Texas A&M. "Other institutions use pretty traditional design that pays lip service to the evidence. There may be high style, but the hospital is still noisy. Or the windows are too small to let much light in. There are missed opportunities."

Besides privacy, [research](#) shows that [single rooms](#) reduce infections and patient stress, and improve sleep. In 2006, the [American Institute of Architects](#) called for single rooms in all new hospital construction.

In Plainsboro, N.J., University Medical Center at Princeton is building a 237-bed hospital at a cost of \$447 million. A model room is taking shape in the current building. "We want to test it out in the real world," said Barry S. Rabner, president of Princeton HealthCare System, which runs the hospital.

Because studies suggest that [natural light can reduce depression and that scenes of nature can reduce reported levels of pain](#), rooms in the new hospital will have large windows looking out toward woods and the Millstone River. A handrail next to the headboard of the bed will prevent falls. To prevent medication mix-ups and reduce the time nurses spend fetching drugs and supplies, a small locked cabinet called the nurse server will contain only the medicine for the patient in that room.

A sink near the door will allow nurses, doctors and visitors to wash their hands before entering. The rooms will be angled to create sight lines from the hallway to the bed so nurses can easily see patients, and vice versa. Acoustical materials will dampen noise, and to encourage families to visit and spend time, the rooms will be spacious and equipped with extra storage.

Mr. Rabner recently showed a reporter a semiprivate room in the current building, an aging facility updated with a maze of additions.

"This does not create privacy," he said as he pulled a curtain between the two empty beds. "There is no space for family. No storage. The patient by the window has a long walk to the bathroom. There's no handrail by the bed."

Down the hall a patient, Jay Paszamant of Princeton, said he would be more comfortable in a single room. "I have to walk past his family on the way to the bathroom," he said, referring to the young man in the next bed. "And I feel uncomfortable overhearing my neighbor's issues. I don't want to invade his privacy."

Insurers who pay the bills want to know that the single rooms and the nature scenes will be more than just attractive. "When a hospital makes a change — buys a new machine, builds a new building — they need to be prepared to discuss those changes with the people purchasing their services," said Susan Pisano, a spokeswoman for the trade association America's Health Insurance Plans. "They have to make the case that these changes will improve quality and safety and efficiency."

The Center for Health Design, a nonprofit based in California, is promoting research through its Pebble Project. A [Pebble Project](#) study at St. Alphonsus Regional Medical Center in Boise, Idaho, for instance, found that reducing noise levels improved patients' self-reported sleep quality by almost half — to 7.3 on a scale of 10, up from 4.9.

Another study, at Bronson Methodist Hospital in Kalamazoo, Mich., found that after new private rooms were added, with well-located sinks and improved air-flow design, hospital-acquired infections declined 11 percent.

The design research examines elements large and small. After Sacred Heart Medical Center at RiverBend in Springfield, Ore., installed ceiling lifts in part of its original building, staff injuries related to moving patients declined to one a year, from 10. "We think they paid for themselves within two years because of reduced worker's compensation," said Jill Hoggard Green, the hospital's administrator.

Architects and administrators are listening to patients. In Michigan, [Henry Ford](#) West Bloomfield Hospital largely eliminated plans for the new hospital's emergency department after patients tested a simulation laboratory.

"We started over," said Christine Zambricki, chief operating officer and chief nursing officer of the new hospital, which opened in March. Emergency room patients, the hospital learned, wanted rooms large enough so visitors did not have to stay in the waiting room. They wanted greater privacy — walls, not curtains, between patient beds — and a private bathroom.

"They didn't want to walk to the bathroom and see other people bleeding and crying," Ms. Zambricki said.

In many new hospitals, central nurses' stations are being replaced with smaller ones closer to patients, said Anjali Joseph, director of research at the Center for Health Design. "Design is not just focusing on making new hospitals pretty and nice," she said. "It's focusing on the patient outcomes we want from building design.

"It's possible that old hospitals where the nurses and the staff are great can succeed in the worst environment. But they have great obstacles to overcome."

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