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DESIGNING FOR SAFETY

The next generation of patient rooms

BY CATHERINE GOW, AIA

Designing and detailing the next generation of patient rooms to decrease falls and hospital-acquired infections (HAIs) is extremely significant for our healthcare systems. Since Medicare/Medicaid reimbursements to hospitals are continuing to decrease, it is more important than ever for the healthcare industry to address unreimbursed “never events.” In addition, the Center for Medicare/Medicaid (CMS) has taken a nonreimbursable stance to hospitals on “never events,” or its 28 serious reportable events. Hospitals cannot pass these costs along to patients. This causes unreimbursed losses to hospitals and healthcare systems to the tune of millions of dollars.

Of these 28 “never events,” 70% occur because of two major causes: pressure ulcers and patient falls. According to the American Hospital Association, in 2009, pressure ulcers cost $43,180 and injuries due to falls cost $33,894 per occurrence, on average. In the same year, pressure ulcers cost healthcare systems overall $11.1 billion, and falls with injuries cost $6.5 billion. These events force longer patient stays and make patients vulnerable to HAIs. The CMS is now considering decreasing reimbursement to hospitals for certain HAIs, in addition to already cutting funding for “never events.”

Charting a course toward a safer patient room

Francis Cauffman assembled an expert advisory committee, with members from across the spectrum of the healthcare industry, to work with the architecture firm’s healthcare team and take a look at the design of patient rooms. The goal was to solve the problem of patient falls,
Research and evaluation
The team evaluated the designs of existing patient rooms and investigated the reasons why patients fall. The committee determined that most falls could be attributed to either the design of the patient room or incidents of patients getting out of bed unassisted and unobserved. The attributing causes were:

- Limited views into patients' rooms. Some room designs restrict visibility of patients from corridors and nurses' stations.
- Limited family space. This causes fewer family members to be present in rooms and less able to observe patients.
- Poor access to toilet rooms. Most patient toilet rooms are located across the room from the beds, which creates unassisted travel paths from beds to toilet rooms.

Creating safe solutions
To solve these design deficiencies, the committee applied evidence-based design (EBD) principles to create a room with several important design solutions focused on patient safety. The principles of a truly safe patient room include:

Different prototypes have different advantages. Credit: © Francis Cauffman.
European-style bathroom layouts provide space for caregivers and patients.

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FEATURE

- Larger space for family members
  While inboard toilet room arrangements can limit views into patient rooms if not designed properly, they can create larger family spaces that can accommodate visitors and limit patients' unattended bed exits. Adding amenities, such as space for the family to use laptops or reading areas, helps to optimize and activate the spaces, thus keeping family members in the rooms to provide additional support for the nurses and hospital attendants. Inboard toilet arrangements maximize the window and family spaces along the exterior of buildings.

- Safe bed exiting
  To aid nurses who assist patients exiting the bed, safe patient rooms have large clear floor areas near the patient beds for mobile or ceiling-mounted bed lifts. These devices safely transfer patients who have difficulty leaving their beds. In the event that patients do leave their beds unattended, toilet rooms are strategically located at the head of the patients, near the beds; grab bars help patients travel to the toilet rooms and fixed night-lights shine the way. Bathroom lights that turn on automatically upon patient entry can create a safer environment.

- Wider door openings for patient bathrooms
  Traditional patient toilet rooms have a single door, giving a maximum opening of four feet. Wider entry doors to patient toilet rooms allow caregivers to enter the toilet rooms side by side with patients. This enables them to aid patients with all functions. EBD studies completed by the Agency for Healthcare Research and Quality have tracked improved outcomes when wider doors are used for patient bathrooms.

- Open showers in patient bathrooms
  It is safer for patients if showers are sized to accommodate either shower chairs within the showering space or have space for caregivers to maneuver patients. Open, or European-style, showers allow space for patients to shower safely.

- Finishes that reduce the spread of infection
  To minimize slips and falls in toilet rooms, smaller format ceramic tiles utilizing more grout create a better grip or traction underfoot. Inside patient rooms themselves, either vinyl sheet or plank flooring with padded backing further helps with traction. Throughout the entire room, it is safer to have surfaces that can be easily decontaminated.

- State-of-the-art technology and equipment integration
  State-of-the-art equipment gives patients more control over their physical environments. Bed manufacturers have been proactively attempting to increase patient safety by adding bed weight alarms and other safety features. Beds that can drop down to at least 16 inches above the floor are safer because they prevent falls. The next generation of patient beds or room controls will be even safer if patients are able to control lighting levels and adjust window treatments from their beds. In the future, the integration of these technologies will create a single design solution that allows patients to have access to these controls.

  Cameras installed to monitor patients while nurses are on the go will allow staff to visually monitor their patients. These cam-
eras can be combined with remote communication tools, which allow nurses to calm and assure patients that help is on the way whenever needed.

- **Prominent staff handwashing sink/gel locations with strong visual cues**
  To prevent HAIs, it is of paramount importance that the staff handwashing sink is near the entry/exit of the patient room. This is not necessarily a new concept. However, the safer patient room incorporates design interventions or visual cues that remind caregivers to wash their hands. Some of these visual cues include direct downlighting over the sink and/or floor patterns leading up to the sink from the entry/exit.

- **Decentralized nurses’ stations**
  Decentralized nurses’ stations put nurses out closer to their patients where they are able to quickly assist them. This touchdown station allows nurses to quickly check in on patients more easily than if a floor has a single centralized nurses’ station.

**Testing the hypothesis**

Francis Cauffman is going to construct the prototype safe patient room that includes the elements described above. Experts, along with clinicians and nurses, will be called on to test the different design features. Patient care focus groups and volunteer patients will also be asked to review the room. With everyone’s input, the room will be continually refined and improved. Ultimately, the safe patient room will be built within a hospital setting. Francis Cauffman will conduct a study to document the number of patient falls within this new room; its architects will then compare those statistics with the number of falls in other existing patient rooms.

**Conclusions**

The post-World War II hospital building boom has left the healthcare industry with buildings that have little flexibility. They commonly have double patient rooms and small individual patient rooms. As hospitals replace this aging infrastructure, they need to create safer patient rooms with design features that can help significantly decrease patient falls and HAIs. These upgrades will not only provide hospitals with a safer environment, but also with a good return on investment.

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