Mock-ups: Giving hospital clients the ultimate reality check

BY KATHY L. BELL, AIA, ACHA • PHOTOGRAPHY COURTESY OF THE S/L/A/M COLLABORATIVE (WOODRUFF-BROWN PHOTOGRAPHY)

“Virtual reality” has its virtues. Technology allows architectural designers to show our customers around a space without ever really entering it, viewing it from angles that simply aren’t visible from a rendering or interior elevation. A virtual walk-through can greatly enhance a client’s perspective and understanding. However, with healthcare spaces that are repetitive and technologically advanced—such as operating rooms, patient rooms, or nursing units—there is no substitute for the full-scale experience of a room mock-up.

Why spend the time, money, and effort to construct a room that easily can be generated in 3-D on a computer screen? Because there is enormous value in a reality check. Only when hospital staff, potential patients, and family members can touch, see, move around in, and respond to a space can they fully understand it. Pictures, computer-generated drawings, and projected images won’t suffice. Only a mock-up can provide the requisite experience.

Diverse individuals use healthcare spaces, and they all should have a chance to experience the end product. All opinions should be gleaned, both through departmental and individual surveys, during the critical design phase. A mock-up gives everyone an opportunity to respond to design decisions and provide valuable input.

Probably the biggest advantage to a mock-up is that it helps people fully experience the size of a room. The scope of an operating room being expanded from 400 to 600 square feet may be incomprehensible until the staff can gain perspective through a mock-up. A mock-up also helps designers make adjustments to such practical decisions as the mounting height for outlets or the position of a sharps-disposal container. A full-scale reality check can fine-tune decisions that otherwise might be off by a few feet.

Because the healthcare industry is constantly evolving with new technologies changing approaches to patient care at a rapid pace, we must evolve with these changes as designers. Mock-ups allow us to develop solutions that accommodate the technology, as well as the people who use it.

Preliminary considerations
Before building a mock-up, designers should evaluate the existing environment to understand staff interactions with patients and each other. Visiting other institutions that have recently renovated or constructed a similar department can be instructive, particularly when the institution or project is comparable to your own. The good, bad, and the ugly should be exposed and talked about after the tour.

Ideally, a mock-up should be built where it may remain in place during the construction phase. This allows the contractors or subcontractors to use it during the pre-bid walk, giving everyone a complete understanding of the scope of work. During construction, it can be used as a reference for overall content or design decisions that may be affected by field conditions. Maintaining the mock-up room also allows future employees and potential donors to tour it during construction.

Making the most of a mock-up
After the mock-up space is built, it’s time to test the decisions that were made on paper. Whether the mock-up is extensive or simple, the goal is to get the big kinetic picture. If the mock-up is for a patient room, consider having volunteers act as the patient and family members. This will bring the space to life and allow staff to respond to specific circumstances rather than imaginary ones.

Ideally, key members from the hospital project team and design firm will be available to respond to questions about design decisions. Not all attendees will want to complete a survey, but most may wish to offer input.

After the project team has reviewed the space, there should be a general orientation for the survey participants. Exposing the mock-up to a wide audience will allow the team to test decisions and reexamine issues that may have been overlooked. Each participant should have the opportunity to complete a survey form tailored to the specific space. For best results, make sure the survey is concise, and attach a plan of the room for easy reference. When reviewing responses to the survey, you should focus only on information that could have a positive impact on the design of the space. Don’t expect unanimity—not everyone will be pleased with your final decisions. What’s important is that they all have a chance to voice their opinions.

Analysis by “zones”
A patient room in a nursing unit or an emergency department exam room should be analyzed according to who will be occupying the room at any given time. How is the patient’s “zone” affected when a nurse, physician, or family member enters? What is the overlap between the physician and nurse when they are in the room at the same time? Are there any conflicts with the family zone? Consider the movement not only of equipment (e.g., a stretcher), but also of people.

Is the sharps-disposal container positioned in a convenient location for the medical staff and also where the outside disposal vendor can access it without intruding on the patient or family? How many people can easily be in the room if a patient is crisis? All of these questions should be considered with care.

Real success stories
Room mock-ups can vary greatly in size, scope, and expense. What matters most is that the prototype mirror reality enough to im-
merse people in the space. A few examples are listed below.

Planetree Nursing Units, Griffin Hospital, Derby, Connecticut. The unique design of this hospital's med/surg patient room cluster and ICU room made it a perfect choice to evaluate with a mock-up. The S/L/A/M design team constructed a portion of the patient cluster in a nearby warehouse, using lath and cardboard for the walls. A separate mock-up was constructed for the ICU room. The team then "wallpapered" computer-generated interior elevations onto the cardboard, showing the locations of the devices and equipment. The entire hospital staff toured the mock-up and responded to a questionnaire. "All felt they had participated in the design of the
rooms and, in that sense, took ownership of it when they moved in,” says S/L/A/M healthcare planner Howard F. Phillips, AIA, ACHA.

Hartford Hospital, Hartford, Connecticut. In an existing space at the hospital campus, the S/L/A/M design team built a full-fledged prototype for new labor and delivery rooms in the maternity unit (figure 1). The mock-up included detailed finishes, custom cabinetry, and woodworking, complete to the design intent (figure 2). Despite the fact that the project was a reconstruction of an existing unit, the team determined that a detailed mock-up was worth the effort, especially since the hospital was planning to invite focus groups of community members to view and comment on the proposed new design. Consequently, the mock-up served to both solicit community input, as well as to help the client understand the size of the renovated rooms and how they would function within an existing unit.

Middlesex Hospital, Middletown, Connecticut. A new emergency department, currently under construction, will more than triple the size of the existing ED, encompassing 28 private rooms, one two-bay resuscitation room, an eight-bay behavioral health unit, and a six-room fast track unit. Designers mocked up the entire room design, complete with paint colors, wall protection, casework, a sink, entrance door, lighting, and medical equipment. All staff members toured the space and provided verbal input to S/L/A/M healthcare planner Nancy T. Connell, AIA. “The mockup room enabled all ED staff members to see and feel how the elements of the physical room and equipment enabled them to perform their tasks,” explains Michael Saxe, MD, FACEP, chairman, department of emergency medicine for Middlesex Hospital. “We received comments from physicians, nurses, physician assistants, techs, and paramedics, then revised the layout and equipment, based upon staff input.” Based on their comments, locations of the physiological monitor, medical gases, and sphygmomanometer were adjusted.

Northern Westchester Hospital, Mount Kisco, New York. The S/L/A/M Collaborative is currently designing a new emergency department for Northern Westchester Hospital to replace existing open-bay cubicles with universal private rooms. Before constructing a full room

Figure 2. Inside the finished mock-up at Hartford Hospital.
mock-up, the S/L/A/M team provided a schematic mock-up to explore some early ideas. They established the boundaries of the mock-up by using one corner of a larger conference room with tape on the floor to define the room footprint, then printing out and pinning up a full-size computer-generated elevation of the patient headwall, showing all outlets and wall-mounted equipment. The team also constructed a sink and counter out of foam insulation and fully furnished the room. Almost 30 staff members—from ED physicians and nurses to environmental services—offered their input. The core ED team ran through emergency scenarios to gain consensus on the orientation and visibility of the patient and the location of the hand-washing sink, sharps container, and computer workstation. The schematic mock-up will form the basis for a “true to life” mock-up in the near future.

“the preliminary mock-up ... allowed multidisciplinary teams, including respiratory therapy and anesthesia, to be in the space and fuel the methodology for how they would work in the new environment,” says Maria Hale, vice-president, patient advocacy and service excellence for Northern Westchester Hospital. “This exercise required staff to see things from the patient's perspective as they played the role of both patient and visitor.”

Conclusions
Since the total cost of a typical hospital project eclipses that of a mock-up by a wide margin, this preliminary step is well worth the investment. It can make the difference between a virtual perspective and a real one—ultimately maximizing patient comfort and staff efficiency and preventing errors that can impact health and safety.

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