For optimal OR design, play by the rules and get expert advice

Designing an OR suite involves detailed planning, knowledge of regulations, an interdisciplinary team, a laser focus on process, and even a little bit of luck. Keeping all the balls in the air requires a master juggler, and OR managers are uniquely suited for that role.

Architects and planners use guidelines like the newly released 2014 Guidelines for Design and Construction of Hospitals and Outpatient Facilities from the Facility Guidelines Institute (FGI) to design facilities. These guidelines “contain quantitative elements that reflect changes in healthcare delivery, but they don’t speak to the qualitative use of space,” says Bill Hucks, BA, RN, CNOR, an associate and healthcare planner with the Seattle office of NBBJ, an architecture firm. “It’s the operational, functional workflows and facility utilization that guide excellent healthcare facility design.”

OR managers should be able to rely on facility managers for in-depth knowledge of quantitative guidelines. “The facility manager is the gatekeeper for the different building codes and standards,” says Doug Erickson, FASHE, CHFM, HFDP, CHC, chair of the FGI Health Guidelines Revision Committee and president of TME, Inc, Little Rock, Arkansas. However, overall project success depends on understanding both the quantitative and qualitative aspects affecting the perioperative services environment.

New guidelines for new times
FGI guidelines, updated every 4 years, are referenced in 42 states. The guidelines provide design and construction minimum standards intended to promote a safe and efficient environment for delivery of high-quality, cost-effective care.

A total of 130 people—including anesthesiologists, surgeons, infection preventionists, intensivists, hospital administrators, architects, security professionals, and representatives from the Centers for Medicare & Medicaid Services (CMS) and Veterans Affairs—served on the committee to revise the guidelines.

“We’ve made this as multidisciplinary as we could, including all the key departments and professions in the healthcare facility that would be providing service, and we have also included many state authorities having jurisdiction,” Erickson says. “It’s like a typical planning and design team in the hospital.”

About 20% to 25% of the committee is rolled over from one update to the next. Erickson says anyone interested in serving on the committee can send him a resume for consideration.

FGI partnered with AORN in updating the guidelines. “The guidelines highly rely on the expertise of our partners at AORN to provide us with the operational characteristics of operating room environments,” Erickson says. The new guidelines bring outpatient and inpatient surgery requirements into greater alignment, a necessary step as more surgical procedures move from inpatient to outpatient settings.

Erickson says three major changes in the guidelines relate to the definition of an
OR, ventilation requirements for endoscopy rooms, and point, or flash, sterilization (sidebar).

“We define the operating room a little bit differently than we have in the past, particularly from an outpatient perspective,” he says. “We now have one classification for ORs and one for procedure rooms.”

The new definitions for procedure room, invasive procedure, and semirestricted and restricted areas of the surgical suite form the basis for determining the types of procedures that can be performed in an OR vs a procedure room. Procedure rooms don’t require a restricted environment and are used for procedures that don’t meet the definition of invasive procedure. Conscious, minimal, or local anesthesia may be given in procedure rooms.

The new guidelines drop the requirement for negative or positive air pressure for ventilation of endoscopy rooms. “If you want your endoscopy room to stay negative, you can do that, or if you want it to be positive, you can do that, too; you’re still in compliance,” Erickson says, adding that research doesn’t support one option over the other.

Point sterilization also is no longer required, reflecting the trend to minimize its use. “You need to set up central sterilization so an item can go from the OR to central and come back,” Erickson says. “We aren’t seeing the need for flash sterilizers in the central core.”

He notes that adding point sterilization would require multiple rooms and would be expensive, so OR managers should plan for sterile processing departments to be near the OR suite.

**Setback: A savings opportunity**

In addition to these changes, the 2014 FGI guidelines permit OR “setback,” which refers to reducing the number of air changes during the several hours an OR isn’t in use (such as overnight) to achieve energy efficiencies.

Setback is “like setting back your thermostat at home when you aren’t there,” says Erickson. “It’s the same except with air volume instead of temperature and humidity.”

OR managers, anesthesiologists, and surgeons have been concerned that an increase in particulate matter could cause infections, but Erickson says setback is a safe, effective way to save money. “You can set back the number of air changes per hour, maintain temperature and humidity, and save $10,000 to $15,000 per year per operating room in energy costs.” He adds that the number of air changes can be brought up “in minutes, not hours.”

Adjustments may have to be made before implementing setbacks. “You might need to add some dampers or controls, and you may need an outside consulting

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**Changes in the FGI guidelines**

Below is a summary of key changes in the 2014 guidelines.

- New definitions for which procedures can be performed in an OR versus a procedure room.
- New requirements for hybrid OR rooms, such as sizes and clearances.
- Low humidity levels of 20% are now acceptable, so taking a daily humidity reading is unnecessary.
- The minimum inpatient OR size is still 400 sq ft, but the minimum outpatient OR (previously anesthesia Class B and Class C rooms) size is 250 sq ft. What used to be called Class A rooms are now procedure rooms, and the minimum size is 150 sq ft. Endoscopy rooms have a minimum size of 200 sq ft.
- Restricted space has been redefined, including removing the requirement for staff lounges to be in or tied to restricted space.
- Preoperative and Phase I and II postanesthesia care units (PACUs) are considered unrestricted areas, so people do not need to wear special clothing.
- The minimum number of required Phase I PACU patient care stations for both inpatient and outpatient is 1.5 per OR.
- There must be one handwashing station for every patient care station in preoperative and PACU settings.
- At least one scrub station must be next to the entrance of each OR. (A scrub station with two scrub positions may serve two ORs as long as it’s located next to the entrances.)
- A substerile room between two ORs is no longer required.
- Facilities are now expected to complete a safety risk assessment, which previously was optional. OR managers may be involved in parts of the assessment, such as evaluation of security, patient handling, and patient fall assessment.

Sources: 2014 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities Major Additions and Revisions; Doug Erickson, FASHE, CHFM, HFDP, CHC
firm,” Erickson says. “But it’s not an overly expensive thing to do.” Even if a hospital spent $10,000 in the first year to make the modifications, it would quickly recoup the cost through annual energy savings.

“We have to get over the fear that we’re going to have some kind of adverse event by reducing the air change rate,” Erickson says, noting that major engineering associations and AORN accept the practice of OR setbacks.

### The big three and more

The FGI guidelines are one of what Hucks says is a trio of guidelines that any facility must meet at a minimum. The other two are guidelines from the National Fire Protection Association (NFPA) and the International Building Code. Currently, CMS is using the 2000 edition of the NFPA guidelines but has asked for comments on switching to the 2012 edition. “However,” Erickson believes, “we’re still 6 to 12 months away from seeing CMS make the change.”

Other resources include the Operating Room Design Manual from the American Society of Anesthesiology. The manual covers the design process, infrastructure, and other topics such as room ventilation systems, hybrid ORs, and postanesthesia care units (PACUs). The Joint Commission also has design requirements, and AORN standards provide an excellent resource. Of course, hospital officials also must know local and state agency requirements.

### Qualitative design

“Qualitative design refers to working with the team and having the right people at the table to ensure there is an understanding of the current workflow,” Hucks says. The team must include everyone from architects and facilities managers to service line staff.

“Each person has their part,” says Deborah Rideout, BSN, RN, CNOR, director of perioperative services for Southcoast Hospitals Group in New Bedford, Massachusetts. “It’s important to have honest, respectful discussions.” Rideout, who oversees three acute care ORs and one surgical center as well as PACU and sterile processing departments, just completed one OR design project, is in the middle of another, and is launching a third.

She notes that architects and facilities managers “keep us grounded in reality by telling us the constraints that exist. We have great ideas, and we need them to balance us by telling us what parts we can do and what we can’t do” because of factors such as department of public health regulations.

### Inclusive planning process

“The most common mistake managers make is they leave out the users,” Hucks says. Managers might feel they can’t spare the time for staff to attend meetings, but the staff perspective is key. “The most valuable part of the design process is the user meetings,” he notes.
Nora Paul, BSN, RN, CNOR, administrative director of surgical services at Bon Secours Maryview Medical Center in Portsmouth, Virginia, agrees: “I can’t stress enough the importance of the OR team being involved in the planning.”

Paul opened a new minimally invasive OR in 2013, bringing the total number of ORs to 10; the hospital has an annual volume of 6,500 cases. “They came to planning meetings and were involved in everything from the placement of clocks to the location of electrical plugs. They are the ones who have to work there,” she notes.

Rideout suggests having both innovative and “challenging” staff on the design team as a way to avoid Monday morning quarterbacking. “They are there for the lengthy conversations and can hear when ideas aren’t possible because of constraints,” she says. “They can then speak to that when their peers wonder why certain decisions were made, such as having to angle the front desk because of a firewall.”

Top leaders above the perioperative level should also be part of the design team. “They can articulate the vision and help avoid silo-seeking behavior,” Hucks says. He adds that OR managers should have key metrics such as projected volume growth, first case start times, and block utilization at hand before meeting with the design team. “You want to have a good sense as to what the opportunities are.”

Timing of top leader involvement is key, says Rideout. Depending on the project, “a higher level VP may be there at the start when we are deciding what the structure will look like and overall costs,” she notes. “Once the business plan is completed and costs are validated, the vice president steps back from the day-to-day process but keeps informed of progress and is available for issues that may arise.”

**Perspective**

The use of full-size mockups of a proposed OR room has become standard practice. “You can make a plan, but you don’t really know how everything will work until you see it,” Hucks says. Mockups need not be expensive; simple materials such as cardboard can be used.

Rideout says getting a “bird’s eye view” of a design through a paper model or on a computer provides the perspective of what the design will look like when someone is in the work environment. “What looks like a good idea on rice paper might not work,” she notes. For example, the design of a PACU station seemed ideal until the team realized that once carts were in place, it was difficult to see the patient.

OR managers should monitor what’s happening on a daily basis with the construction. “Contractors need to know that they are working around our schedule, not theirs,” Paul says. “If we have patients in the rooms, we can’t have pounding going on.”

Even a simple issue such as room temperature must be considered. Paul says that heating and cooling work in the room being built interfered with the temperature in other rooms. “That kind of work needs to be done at night, not during the day when you are doing surgery.”

OR managers also must be ready for the unexpected. Paul says about a quarter of the way through the project, it was discovered that an additional hallway was needed for fire safety compliance. Although the project still finished on time, she says, “You have to understand that even with the best of plans, unforeseen events can occur.”
Design trends
Hucks identifies several design trends:
• Continued growth in the number and size of hybrid suites. “What was 400 to 500 [square feet] for a standard OR is now 500 to 600, and a hybrid typically 1,000,” he says.
• More universal rooms and less specialization by surgical service.
• More use of “same handedness” design so that each OR room is set up the same. In addition to safety, Hucks says same handedness “promotes operational efficiency when it comes to stocking and moving equipment.”
• Minimization of just-in-time sterilization.
• More full case cart systems and more equipment placed on booms to avoid cords on the floor.
• A move to a flexing combined preop/PACU model.
• Use of Lean methodology as part of healthcare design.
  “Leave things as flexible as possible,” Hucks advises. “We know there is going to continue to be more technology in the OR that is going to require more floor space.’
  Paul sums up the goal of excellent OR design as “combining total compliance with regulation with what’s best for the patient.”

Cynthia Saver, MS, RN, is president of CLS Development, Inc, Columbia, Maryland, which provides editorial services to healthcare publications.

References