Planning and staffing a hybrid OR

“Building hybrid rooms is building for the future,” says Nicholas D. Troeleman, RNFA, director of perioperative services at the University of Maryland Medical Center (UMMC), Baltimore. “Having hybrid rooms in a research setting like the University of Maryland gives physician researchers the ability to develop new techniques and build on existing techniques.”

More importantly, Troeleman says, hybrid procedures offer advantages to patients. Risks are minimized because the patient has one operative episode instead of two or more, and length of stay and recovery time are shortened. UMMC built its first interventional suite in 2004. A pediatric hybrid OR opened in September 2010, and another adult hybrid OR will be opened later this year. The latest hybrid room will bring the total number of ORs to 31.

Troeleman and other perioperative leaders shared their advice for planning and staffing these complex surgical and interventional environments.

Designing a hybrid room

“You really need to think about the space, how to organize where to put the booms and lights, and the patterns of how you move in and out of the rooms,” says Lisa Morrissey, MBA, RN, CNOR, nursing director for the OR at Massachusetts General Hospital (MGH) in Boston, which has 1 hybrid room and will soon open 4 more in its new building, in addition to MRI and CT surgical suites.

Plan for an expanded team

Additional staff is needed for the imaging equipment.

“You need to think about the hours of operation, including nights and weekends,” Morrissey notes. “Will you partner with radiology and/or cardiology, or will you hire this staff? When you add imaging equipment, it adds to the count for your staffing pattern.”

Negotiate service contracts

“The contracts for preventive maintenance are quite expensive,” Morrissey advises. Whenever possible, provide in the contracts for any upgrades that become available between the time the equipment is purchased and the room is opened.

Plan for volume

If an existing room will be taken out of service to provide space for the hybrid OR, plan for what to do with the volume that will be displaced during the renovation.

Evaluate infrastructure

In particular, consider the ceiling height, weight the floor will accommodate, and size of the room. MGH constructed a mockup that enabled clinicians to understand where the OR booms and lights could move without creating a conflict with the imaging equipment. After mockups, Morrissey says, “we decided the space in one of our existing cardiac rooms
wasn’t large enough to hold the imaging equipment. It would have been difficult to take care of the patient and have all of that equipment and technology in the room.”

Square footage for hybrid ORs varies by specialty, she notes. For example, MGH is adding the Zeego robotic imaging system from Siemens, used primarily for cardiovascular procedures, which requires additional space because of its robotic arm.

**Make site visits**

Site visits were helpful for the team at the Inova Heart and Vascular Institute in Falls Church, Virginia, which opened a hybrid room in December 2010 as part of an 8-room cardiac surgery suite.

The site visits allowed the team to see what they liked and didn’t like about a room and equipment and what would work for their hospital, notes Mary Kroetch, MS, RN, CRNFA, the institute’s director of perioperative services.

**Ceiling mounted or floor mounted?**

Systems for hybrid rooms may be ceiling mounted or floor mounted. Each has advantages and disadvantages.

Ceiling-mounted systems keep floor space free for OR traffic and patient flow but can impair the ability to mount OR lighting and affect air filtration systems. Floor-mounted systems keep the ceiling free for conventional OR lighting and imaging booms but affect anesthesia space, OR traffic, and workflow.

Inova’s team decided to suspend all of the equipment from booms. To make sure imaging equipment could be moved out of the way quickly if they had to convert to an open procedure, they extended the overhead rails that the equipment runs on all the way to the front and back of the room.

“We can move all of the equipment out of the way in about 30 seconds,” says Kroetch.

**Procedure tables**

Tables for hybrid rooms must combine imaging capability and positioning flexibility. Hybrid tables must be nonmetallic and made of carbon-fiber to optimize imaging equipment. They also must be able to slide back and forth, rotate side to side, and move into Trendelenburg and reverse Trendelenburg positions to accommodate intraoperative angiography and fluoroscopy equipment.
Morrissey notes that Trumpf has recently developed a more flexible table (TruSystem 7500) that can work with a single-plane imaging system that MGH plans to install in its new building.

**Staffing training for hybrid rooms**

UMMC does not cross-train staff from the different services for the hybrid OR. Says Troeleman, “It is too difficult for the staff to be expert in all procedures and maintain competency, and it could put them at jeopardy for burnout.”

The cardiac surgery team of about 20 members assists with open, minimally invasive, pediatric, and adult cardiac cases. Staff cover call for both the main and hybrid ORs. The adult and pediatric cath labs have separate personnel.

“The multidisciplinary staff work well together. We haven’t had any turf battles and don’t expect any,” notes Cynthia Aracan, BSN, RN, a cardiac team member.

Personnel from all of the services are trained in aseptic technique and sterile setups. “They have to remember to treat the case as sterile from beginning to end. Even though the patient might be scheduled for a minimally invasive cath, the draping and room setup are treated as for a full-blown surgical case,” says Aracan.

**Introducing teams**

At Inova, different teams have been trained to the hybrid room by letting each service use the room to perform cases distinct to its specialty. Next, teams from the separate services will be trained together so personnel will get to know each other and be comfortable working together. This spring, the teams will begin performing percutaneous valve procedures together in the hybrid room.

Kroetch says OR staff have been cross-trained for some time to perform catheter-based interventions, such as stents for thoracic aneurysms. Though cath lab personnel perform catheter-based procedures daily, she does not plan on cross-training them for surgical procedures.

The electrophysiology (EP) staff already perform minimally invasive and percutaneous atrial fibrillation ablation procedures in the OR and the EP lab. Soon they will be performing hybrid procedures in which an interventional EP physician and an ablation surgeon work together on the same patient at the same time.

“It will be the percutaneous aortic valves that will bring all the teams together. We are very excited about doing them and doing them in the hybrid room,” says Kroetch.

**Best of worlds**

In the end, the hybrid room combines the best of all worlds to benefit the patient. The baby boomers are aging, and they are looking for options that help get them back on their feet quicker. This new type of procedure room also will enable clinicians to treat patients with complex conditions in one space with the collaboration of multiple disciplines. ◆

—Judith M. Mathias, MA, RN

**References**

Belkin M. The design and implementation of hybrid operating rooms. www.veithsymposium.org/pdf/vei/2761.pdf
