

# OR renovation develops efficient flow

A major overhaul of the ORs at 528-bed St Vincent's Medical Center, Jacksonville, Fla., was aided by close collaboration among the hospital's project team.

During the design phase, the team developed the remodeling plan that included increasing the number of ORs from 16 to 20 by renovating 30,000 sq ft of the existing OR suite and adding 15,000 sq ft. The project doubled

the size of the postanesthesia care unit (PACU) to 30 bays and added storage and support space along with an updated infrastructure and mechanical system.

"The process we used to develop the new OR was good because people on the team had mutual respect for each other," says Phyllis Pease, RN, St Vincent's OR nurse manager. "It was a total team effort. Nobody's idea was discounted."

"The working relationship was probably one of the best I ever had," says Stephan Gartman, RA, lead architect and associate vice president with Cannon Design, Jacksonville. "The hospital had a strong vision and knew the direction they wanted to take even before we came in on the scene."

At the OR Business Management Conference May 10 to 12 in Austin, Tex., Pease and Gartman presented a case study about the project.

### Long overdue renovations

After nearly 40 years of operating out of essentially the same ORs, St Vincent's gained approval in 1997 for a \$15 million expansion and renovation plan. St Vincent's has been ranked for 10 years as one of the best heart hospitals by *U.S. News & World Report*.

"We were working in a tight box and needed to improve the staff's working conditions," says Pease, who also was the OR project team leader.

The design called for 9 new ORs in the addition, with 650-sq-ft rooms for orthopedic, neurologic, and cardiovascular surgery and 1 room for respiratory and contagious diseases. The plan also included 11 general ORs ranging from 450 sq ft to 550 sq ft, including rooms for ophthalmology and urology procedures.



A new OR at St Vincent's Medical Center.

"To make space, we had to push some of the old ORs to the new area, so we ended up with 2 modules (specialty and general)," Gartman says. Construction started in 1999, and the project was completed by 2000 with a final pricetag of \$17 million, which included additional equipment.

The 9 specialty ORs are on the second floor adjacent to the existing OR. Above the new OR module, a 16-ft high facilities "penthouse" was added to house mechanical units, including air conditioning and heating units, the electrical service, water treatment, nurse call, telephone, and data hubs.

### Efficient flow

Developing an efficient flow among the ORs, support areas, and PACU was important.

"We focused on that even though we had space constraints," Gartman says.

The group agreed that a "race-track" plan with the ORs arranged around a center core would allow movement around the suite and enhance response times.

"All spaces are within reasonable distance from the PACU as well as from the control spaces," Pease says.

The smaller general, ophthalmology, and urology ORs, located in the renovat-

ed areas, were clustered around a central sterile supply area. Each pair of these ORs shares a supply room used for case cart staging.

Each OR has a door leading directly to a supply area, which improves efficiency, Pease says.

The redesigned support space also included a new control desk, offices, and a decontamination room, which was not in the OR area before. The unit also has a film processing room, reading rooms, frozen section room, and pharmacy.

### Project planning

Planning for the remodeled OR started in 1992, 7 years before construction began. For 5 years, Pease and other OR staff worked on a preliminary plan to update the OR, but the administration did not believe the time was right to spend the money, she says.

"We identified areas of growth—cardiology, neurology, and orthopedics," Pease says. The initial project team consisted of the director of perioperative services, business manager, nurse manager, chief of surgery, and several chiefs of specialty services.

In 1997, the project was given a green light with a \$15 million budget. Cannon Design, which has a long-standing relationship with the hospital, was chosen as

### Project profile

St Vincent's project included:

- renovation of 30,000 sq ft existing OR suite and expansion of 15,000 sq ft
- a total of 20 ORs plus postanesthesia care unit and support space
- 9 new ORs of 650 sq ft for orthopedics, neurosurgery, and cardiovascular surgery; 11 general ORs ranging from 450 sq ft to 550 sq ft
- approximate cost of \$15 million.

the architect, and Batson-Cook Company, Jacksonville, was selected as the construction contractor.

During 1997 and 1998, other hospital managers were added to the project team, including plant and facilities management, purchasing, and information services.

"At any other hospital, I would recommend bringing together the entire project team from the beginning," she says. "But we have a stable management team and have worked together for a long time. We all knew what we needed."

### Getting feedback

The project team held weekly stakeholder meetings to review blueprints, displaying a detailed timeline on the wall, Gartman says.

"We would look over every line of the initial plans," Pease says. "We would sign off on every one and report to our administrator on how much money we were spending."

Gartman says the stakeholder meetings were important to get feedback on the design and address issues.

"There was good representation and open dialogue that encouraged people to express their ideas," he says. "This process is not for the faint of heart."

One issue OR project teams must decide is how soon to include the architect in the planning process. Ideally, Gartman says the architect should be engaged—even on a per-hour consulting basis—during the time the project team is assembled. "We can help them test their master plan," he says.

Pease agreed architects should be involved as early as possible. "An architect is able to give a point of view we

## Mock ORs tested the work flow.

might not have internally," she says, such as state and federal hospital building regulations. "They can tell you if your ideas are reasonable," she says.

### OR mockups

Even with blueprints, Pease says the OR staff expressed difficulty envisioning the new OR in 3 dimensions. The solution was to build 2 mockup ORs, a 600-sq-ft specialty room and a 450 sq-ft general OR. The contractor built the rooms, equipment was rolled in, and the OR team conducted mock procedures.

"It was a theatrical set," Gartman says. "We tested circulation and work zones and found problems with the design. Some equipment blocked areas, and the location of some doors created cross-traffic where we didn't want it. We made refinements."

The mockup rooms were helpful so the staff could see the orientation of the rooms.

"Unless the new ORs are identical to the current ones, I would highly recommend mock or virtual ORs," Pease says. "This is for the staff—not the management—to explore and provide feedback."

St Vincent's did not budget outright for the mockups. But because space was available off site, the mockups could be built for a nominal amount of \$15,000.

### Underestimating growth

Before the design phase, the project team began an extensive review of the hospital's master plan and matched it with the OR's goals and vision of the future.

"My suggestion is always to update the plan and then integrate it with the business plan for the budgeting of the project," Gartman says. "We took a look at the master plan and didn't take that as being set. We challenged that original

program because of the hospital's goals and priorities."

Though the master plan had allocated 45,000 sq ft for 16 ORs, "we found we needed 60,000 sq ft and 20 ORs," Gartman says.

Even that was not enough.

"We didn't predict enough space and number of ORs," Pease says. "The city and state underestimated the growth of the region, and we used those numbers."

### What worked well?

In addition to building the mock ORs, Pease named these features as ones she and her team would do again:

- **Plan for patient and materials flow.**

"We were very careful in phasing the project and working through the flow prior to each phase," she says. The staff were given flow diagrams before every phase and invited to give feedback. That way, flow issues could be identified and resolved before the next phase began.

- **Standardize design for the ORs.**

"The basic design and fixed equipment, such as columns and cabinets, are identical in all rooms," she says. "We wanted the ability to reverse or change table position to meet the needs of the specialties." Rooms used primarily for orthopedics, neurosurgery, cardiovascular, and open heart surgery have additional view boxes and space for the heart-lung machine, autotransfusion devices, and so forth.

- **Plan equipment "garages."** There are no doors to these storage spaces so the equipment is visible and accessible. "But as always in any OR, the equipment quickly outpaces available storage," she says.

### What would they do differently?

If the team had it to do over again, these are things Pease says they would change:

- **Plan more space for computer equipment in the ORs and at the control desk.** "We underestimated the size of the monitors, even though we use flat screens, and the need to access patient data, x-rays, and documentation simultaneously," she says.
- **Install more automatic doors for improved traffic flow.** "Someone



*St Vincent's Medical Center, Jacksonville, Fla.*

above me took out these features to save money," she says.

- **Place additional staff bathrooms closer to the ORs.** "They are gathered in one spot far from where the staff works," she says. "It is inefficient and inconvenient."
- **Read changes in the design more closely.** "We looked at blueprint after blueprint, but there were changes I didn't catch," she says.

To alleviate overcrowding temporarily, Pease has recommended expanding surgery hours an extra 2 hours to 7 pm. Over the next 2 years, she says St Vincent's will finish updating its master plan, which will include additional space for the OR.

"I don't think we could have the quality of care we do now (without the new ORs) because of the increase in equipment and supplies needed to perform procedures on a much sicker patient population," Pease says. "We are out of space now, and we need to plan for the future." ♦

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