Renovating the surgical suite reaps sweet rewards

by Susan Cantrell, ELS

Renovating the surgical suite these days often means integration. Integrated operating rooms (ORs) are all the rage now, but they were practically unheard of only a couple of years ago. What's the hubbub about? What makes an OR integrated, and why is it such a good idea? How can you accomplish it in your facility without breaking the bank? How do you know when it's been done well?

What does integration mean?

To find out what integration means, *Healthcare Purchasing News* went to some of the industry experts. Rich Schafer, director of project design, STERIS Corporation, Mentor, OH, told *HPN*: "Many people don't understand what integration is, but they know they have to do it." Why do they need to do it? Max Paisley, associate production manager, Stryker, Flower Mound, TX, observed: "Technologically advanced facilities will attract a more talented surgical staff and a higher volume of patients." Randy Tomaszewski, RN/BSN, MBA, vice president of marketing, Skytron, Grand Rapids, MI, agreed, stating flatly: "You can't as effectively recruit doctors if you don't have the latest, greatest technology. The technology is not fluff; it's a requirement to deliver today's highest quality healthcare."

Where do you begin? "Start by gaining an understanding of all the sources that can be incorporated into a good design," said Schafer. David Johnson, product manager for integration systems, STERIS Corporation, continued: "There are two types of OR integration: (1) integration of all the devices that make the OR a more efficient and productive operation, and (2) video integration of high-definition (HD) audio and video." (For more info on equipment in an integrated surgical suite, go to http://www.steris.com/hd360.)

In the article "Planning a Better Operating Room Suite: Design and Implementation Strategies for Success" (*Perioperative Nursing Clinics* 2008;3:43-54), Tomaszewski explained that the integrated OR is not a product in and of itself. "What you are purchasing from the vendor is the brain (hub, user interfaces, etc) that tie together all of the other companies' products. Integrating multiple devices results in changes of workflow and requires creation of a nursing command center within each OR." The nurse managing the command center controls video and data used in the OR, routing signals to users. The signals may come from sources such as endoscopic video cameras; radiographic images, via picture archiving communication (PACS); patient monitors; or the internet. Images and data could also be routed from the OR to remote locations to facilitate teaching or to make consulting in real time possible.

VirtualOR, STERIS Corporation

Assess needs, build a budget

Once you understand the possibilities, you can assess your facility's needs and prioritize according to your budget. And there lies the rub: if you hadn't heard of an integrated OR until a couple of years ago, the money may not be there for it; so, how do you manage to make the shift now? "One of biggest challenges we face," noted Schafer, "is that many hospitals have not budgeted appropriately for integration. It's a new area of cost."

An experienced vendor can help you to assess and prioritize your needs and develop a budget, Schafer noted: "It's a good idea to approach vendors in the planning stage, so as to budget appropriately. Our most successful projects are where we have

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received a lot of input from clinicians," said Schafer.

The planning stage is critical and, according to Tomaszewski, ideally starts 2 to 3 years prior to execution. Tomaszewski encourages facilities to assemble a multidisciplinary hospital team who can "clearly identify where they want to go with the surgical suite. You need input from architects, equipment planners, surgeons, and scrub nurses. You need to consider what role (vision) the facility intends to play in the next 5 or even 10 years. Is the goal to move from being a local to a regional healthcare support system? Does the facility plan to offer more types of services? Will teaching take place in the OR? Know your goals and what you want to achieve. Once a plan is identified, you can begin to look at possible solutions."

Fortunately, integration doesn't have to be accomplished all at once, and there are options that won't blow the budget sky high. Tomaszewski noted that all equipment doesn't have to be bought up front; it can be rented on a monthly or yearly basis, using the operating budget instead of the capital budget to acquire what is needed. A fee-per-use program is another option. "Look for vendors who are willing to work flexibly with you on financial matters," said Tomaszewski.

Visit the virtual OR

Virtual reality is a really useful planning tool used by a number of vendors to create a mock-up so that users can visualize the finished layout. The last thing you want is to find out too late that a door bangs the boom each time it's opened, right? Jim Wetzel, director of marketing and corporate accounts, Berchtold Corporation, Charleston, SC, explained: "We do a lot of custom design work, because we only focus on the OR. We ask the customer what they want and then give them a virtual bird's-eye view of the equipped room. Costly mistakes can be avoided. It's much less expensive to move furniture and equipment in a virtual world."

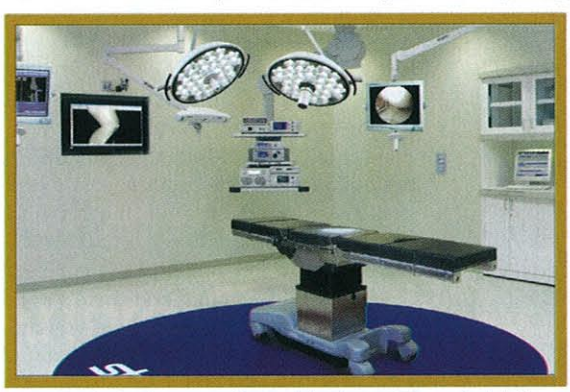
Integrated operating room, Skytron

Open infrastructure

Planning for renovation starts well before you're ready to choose new equipment. The underpinnings must be in place to support current and future technology. That's where the terms *open architecture* and *open infrastructure* come into play. It's not as complicated as it sounds. Basically, it means planning ahead for what the future may hold by installing extra conduit for audio, video, and data, as well as extra capacity for electrical loads. Then, as budgets allow, new technology can be added in the OR without having to take it down for extended periods of time. "They'll essentially have a 'plug-and-play' room, with the ability to grow with technology," said Johnson.

Some vendors can save you money by acting as a general contractor. "We can take a few rungs out of the ladder," said Wetzel, "by helping with planning, design, renovation, and installation of equipment. As a turnkey operation, we can go in and renovate rooms from start to finish. We can help keep the project on time and on track, saving money."

"The key to maximizing dollars is to create flexible infrastructure that allows for changes in technology and that can deliver different capabilities and support different functions. Creating infrastructure for today and tomorrow starts with flexible design for multiple type surgeries," insisted Wetzel. "Design also should accommodate 'techno clutter'."



Stryker iSuite integrated OR with Visum LED surgical lights

Indeed there is more clutter in an OR than there once was. Getting it out of the way can improve efficiency. Tomaszewski said, "You want to get as much equipment off the floor as you can, particularly in small spaces." The key to freeing floor space is to do it correctly, with the least number of mounting structures possible. Done incorrectly, it can affect the flow of the OR, with hanging equipment blocking doorways or access to supplies. That's why it's important to "evaluate every type of procedure performed in the room," said Tomaszewski. "Skytron can put equipment such as surgical lights, flat-panel screens, minimally invasive equipment, smoke evacuation, powered nitrogen systems, and more on booms." Paisley highlighted a bonus to moving equipment off the floor onto a boom, saying it "prolongs equipment life, decreasing dollars spent on repairs and replacements."

Another factor to consider when renovating is room size. Wetzel observed: "Years ago, the standard was 400 sq ft, but now the OR needs 600 to 700 sq ft to allow room for today's equipment." Paisley agrees: "The major challenge with renovation versus new construction is room size. Working with a vendor who has room-design experience can help maximize the flexibility and flow in smaller spaces. Noting ceiling height, HVAC, and building supports is a good place to start, because it can have an impact on the potential location for ceiling-mounted equipment such as booms and flat-panel suspensions."

Another facet of flexibility is the integration equipment itself. "Some vendors may require you to switch over completely to them versus providing an open-architecture, vendor-neutral solution that permits alternative flexibility in available vendor choices down the road. If you switch one room completely to one vendor's products, future technology choices may not be compatible to your chosen integration solution; then you're stuck," said Tomaszewski. "Most hospitals have mixed equipment. It doesn't matter to Skytron whose equipment is in the OR to deliver advanced, flexible communications control. Look for maximum flexibility at minimum cost. We offer clinically superior, affordable, flexible, and durable solutions to match customer needs. If the solution is too expensive to be afforded, it's of no benefit."

Can't renovate? Upgrade

What if you can't afford new construction or extensive renovation? How can you get with the program without breaking the

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bank? "Small hospitals may not be able to go all out, so they look for basic integration," observed Wetzel.

What should come first? Where's the best place to put your money if funds are limited? Paisley believes priority should be given to elements that add value to the hospital. "Invest in equipment that will make money for the hospital and increase patient outcome. Integration increases room efficiency, allowing for procedures to be done quicker and more effectively."

"Not all integrated rooms are $170,000 solutions," insisted Schafer. "Where it isn't feasible financially to do heavy renovation, we have some simple, lower-end solutions allowing integration of the most popular sources, such as an endoscopic camera, PACS, or C-arm images that are sent directly to the monitor in the surgical field. This is useful to an orthopedic surgeon, for instance, because he or she doesn't have to leave the sterile field to bring up images on another monitor in a corner of the room." Johnson added: "It's possible to run signals for the most commonly requested sources in OR—the endoscopic camera, C-arm, and a computer display for PACS—to two flat-panels on suspension arms and not break the $25,000 barrier."

Johnson and Schafer believe it's best to sink your money into things that allow for the best image. "Spend a little more on flat-panel surgical-grade monitors [see sidebar]. They'll give a better image and last for years," explained Johnson. Tomaszewski believes that four is the minimum number of monitors required in an OR today.

Paisley also suggests focusing on equipment that provides improved images: "Upgrading to HD endoscopy equipment should be high priority. Procedures are now being done more safely, precisely, and quickly due to HD advancements."

Paisley recommended upgrading to a multispecialty surgical table, too. "A modular operating room table with top slide accommodates all types of surgeries. Purchasing the right table can eliminate the need for other specialty tables—imaging, fracture, urology, etc."

Another important place to consider putting your money is in better surgical lighting. "Light technology has dramatically improved in the past 2 years," said Paisley. "Light-emitting diode (LED) lighting is cooler, brighter, and more energy-efficient than traditional halogen lights. Surgeons will be thrilled with the brighter illumination of the operative site. LEDs do not emit tissue-desiccating ultraviolet and infrared rays, increasing patient safety."

Johnson and Schafer believe the system from which the lights are suspended is even more important and can enhance flexibility. Suspension systems often are tied to a hub in the ceiling. Inside the arms is where cables, fiber optics, and other components needed to deliver video to flat-panels and power to LEDs on a light head reside. The suspension system also moves flat-panel screens and the lighting system around the room. Schafer said: "With an upgradeable suspension system, you can add an arm. That expandability allows you to adapt your original investment to today's technology and hopefully to new technology under development."

BERCHTOLD designed Supersuite to provide flexibility for today and adaptability for tomorrow

Flexibility and expandability in equipment can save money by minimizing down time. Berchtold uses a combination of booms and lighting products designed to be flexible as technology changes and that can be changed quickly so the down time is minimal. "Another way to maximize money is to standardize equipment," said Wetzel. "It also maximizes efficiency, because the staff only needs to learn the philosophy once, and it's good for the equipment in all the rooms."

The right solution

What's the right solution for your renovation? Figure out your short- and long-term goals and needs; then balance it with your budget. Integrated surgical suites are here for a reason: higher quality and more efficient healthcare for patients, which can translate to sweet monetary rewards for the hospital. Paisley observed: "Integrated operating rooms have been proved to shave valuable minutes off of case time and decrease turnover time, meaning more cases and more dollars for the hospital."

How do you know when the renovation of your surgical suite to incorporate integration has been done right? Johnson said: "You know it's been done right when everyone can go into an OR that's just been renovated or integrated and there's not a lot of training time needed, there's no confusion; the transition into a better way to work is seamless." HPN

Why buy a 'surgical-grade' monitor?

It may be tempting to cut corners by purchasing a consumer-grade monitor. Surgical-grade monitors, however, live in a vastly different environment from consumer-grade monitors and are designed to withstand the rigors of the operating room (OR). Monitors in the OR are constructed from aluminum instead of plastic, for sturdiness, because they are more likely to be bumped by staff and equipment. They're designed without vents, which may help to prevent cross-contamination by disallowing blood and body fluids to invade the monitor. Cooling the monitor without fans or vents eliminates risk of particulate matter being blown into the sterile surgical field. The OR monitor also must be easily cleanable; a dry, soft cleaning cloth won't cut it in this environment.

Additional points to consider when purchasing a surgical-grade monitor include:

- Image response for faster visualization
- Clarity of image provided by high resolution, contrast, and brightness
- Vendor-neutral versatility to eliminate format conversion costs
- Low voltage from the ceiling down to protect staff and patients from the risk of high-voltage exposure
- Strength and durability provided by aluminum cases, sealed membrane switches, and protective monitor surface filters
- Weight and size designed for ceiling arm systems
- Compliance with medical safety regulations and requirements for devices in the OR
- Built-in microphone for hands-free telephone and videoconferencing, allowing surgeon to consult with colleagues without breaking scrub