Expert's advice video integration

In the first of this package of articles, an equipment planner offers advice on planning for OR video integration. In addition to these expert tips, the articles include:

Surgical departments are changing rapidly to integrate the latest technology. If your facility is considering video integration, how do you determine which vendor, performance level, and future flexibility is best for your facility? How do you plan for a smooth implementation?

Vendors' systems differ in their design approach, implementation, and support philosophy. Purchasing a video integration system is similar to shopping for a car. One model has a more powerful engine, but the handling is less smooth than another, or the ride might not be comfortable as a third option.

An OR planning team needs to discern what features best match the facility's needs. Purchasing an integration product without objective evaluation can cause the hospital to drastically overpay for a product that may not match its true needs.

Levels of integration

A basic video integration system has a touch-panel control the circulating nurse can use to manage all video signals in a surgical suite from the source devices to the displays. The system may also have print and recording capabilities, integrate physiologic monitors, and

> ## What features match the facility's needs?

be able to pull up images from the picture archiving and communication system (PACS). More complex systems include cameras, room and light controls, simultaneous video recording, and audio functions. These systems can interconnect various rooms and enable remote viewing of any surgical suite. They can include live lab information, nurse station observation, and sharing of recorded images and video with the hospital's information network.

Why consider video integration?

Integration systems offer advantages that can improve efficiency and the work environment. Examples include:

- quicker case setup and turnover
- improved information availability
- shorter biopsy results by having microscopes online
- easier room swapping options to minimize delays if a case runs longer or shorter than expected
- improved surgeon and senior anesthesiologist efficiency with multiple room viewing options, instant collaboration, and enhanced oversight of residents. Nurse managers can view staff activities, review case turnover, and direct resources to areas of need.

There are a few small studies in the literature that compare dedicated minimally invasive surgery rooms with conventional ORs (sidebar, p 16).

Current equipment costs for a basic integration system are about $50,000 per OR, with higher-end systems in the $120,000-plus range. The return on investment varies, depending on how the system is used and the hospital's surgical case volume.

Planning for video integration

Proper planning for video integration is critical to minimize the impact on OR operations. Ideally, this planning is synchronized with a major renovation or construction of a new surgical suite. Even if full integration systems are not implemented immediately, the infrastructure can be planned so the system can be expanded as components are added.

A different planning approach is needed if the hospital wants to add integration into existing ORs. Existing spaces need to be individually assessed to determine how integration can be achieved while minimizing OR down time.

These are suggestions to consider.

Develop a plan

Consider all of the planning aspects of implementing video integration and develop a macroscopic schedule and roll-out plan.

Even if your options are limited by a lack of space or money, it's beneficial to have a multiyear plan for upgrading your surgical suite for future technologies. Competing hospitals use their advanced surgical departments as selling points to both patients and staff. Having a

plan helps the staff to see that the hospital is taking emerging technologies into account.

Elements of the plan should include, among other steps:

- an infrastructure design solution for each OR (whether for a new area or for renovations)
- the planning process and schedule for discerning the facility's functional needs
- vendor evaluations
- the request for proposal (RFP) and review process
- coordination of which ORs will be down at what times
- budget and procurement timing.

Plan for upgradability

If you account for future technologies initially, incorporating emerging technologies in the future can be almost seamless. But if you buy a system for current technology only, upgrades can be very expensive. The benefit of a thorough planning process is to discern the hospital's true needs and decide which options to include in the current bid, which to add in the future, and which you are choosing not to incorporate. Once you have made these decisions, the infrastructure can be planned accordingly.

For example, a community hospital might want basic integration capabilities, such as video formats from equipment that can come into the ORs. The hospital might decide not to consider networking and streaming of video signals.

In contrast, a teaching hospital may want additional capabilities, with rack spaces to provide for the future addition of enhanced streaming, telemedicine, and other applications.

Modifications needed?

Depending on the existing infrastructure, adding some functions requires facility modifications. For

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example, a hospital with 10 ORs is adding 2 new ORs. None of the existing ORs has integration. The new ORs are being designed to have the room lights controlled by a touch panel. The planning team purchases 12 systems and assumes each room's system will control the lights after installation. But the existing 10 rooms do not have the components needed to capture room light control. Therefore, the integration system will not be able to control the room lights in the 10 existing ORs unless those ORs are upgraded with a third-party room light control system.

It's a bit like Legos. If you design extra space in the equipment rack now and plan extra data jacks at selected locations, adding items can be easy. But if you plan only for current needs, it can cause issues in a few years.

'We hear you'

It is good to record suggestions and thoughts from staff about how the surgical department functions currently, what inhibits their work, and what changes they feel will help. Some suggestions may not be integration related, but by having this information, the hospital can incorporate some suggestions into the long-term plan and provide feedback about why some ideas cannot be implemented.

Haste makes waste

Take time to understand integration before deciding on a single

course of action. A goal should be to make an informed decision that is in the best long-term interest of the hospital. It's helpful to divide this process into 2 steps:

- discovering what options are available
- developing a vendor-independent infrastructure plan.

Separating the infrastructure plan from a future vendor award streamlines the process for the architect and enables the hospital to maintain control over the installation process and minimize change orders. An independent integration specialist can lead this effort and work with the hospital to ensure its best interests are maintained and to ensure vendor proposals are objectively compared in detail.

See integration as a separate product

A key piece of advice is to treat the integration system as a *separate product* ultimately to be standardized in ORs *and not as an extension of any other surgical suite components*. It's a good idea not to favor any one vendor too soon, especially if the vendor is pressing you to avoid a competitive RFP process.

Integration systems should be able to route video images from any source device that may come into that surgical suite at the source device's maximum resolution. Laparoscopic surgery systems come and go quickly and can be specialized for certain service lines. Even if your surgical suite is standardized on a certain laparoscopic system, the connectivity to that system is just one component of the overall integration feature set. Not all ORs need to have the same level of integration, but there are many benefits to having one control system for all ORs: There is one system for the staff to learn, one server location for patient videos, the ability

Integration: What's the evidence?

OR versus MIS suite

A 2009 study from The Netherlands compared preop set up, postop breakdown, and intraoperative times for a conventional OR and a dedicated minimally invasive surgical (MIS) suite with permanently fixed equipment. Intraoperative efficiency was significantly improved in the MIS suite, though an overall reduction in turnover time was not achieved.

—Van Det M J, Meijerink W J, Hoff C, et al. Surg Endosc. 2009;23:2232-2337.

A study from Emory University compared records for patients who had laparoscopic surgery in a general OR versus a dedicated MIS OR. Findings showed that the time between the patient entering the OR and anesthesia induction was significantly shorter in the MIS room, though the mean anesthesia time was not significantly shorter.

—Hsiao K C, Machaidze Z, Pattaras J G. JSLS. 2004:8:300-303.

Ergonomics of integration

Examining the ergonomics of integrated ORs, the same researchers found neck flexion and surgical spine rotation for surgeons and nurses were significantly reduced in a dedicated MIS room.

—Van Det M U, Meijerink W J, Hoff C. Surg Endosc. 2008;22:2421-2417.

to share any signal between surgical suites, and so forth.

Set politics aside

Physicians often have different priorities and preferences, and some may have favorite vendors. The planning process needs to be guided by a project team that is limited in size but representative of the users. Members should be selected for their willingness to view the big picture for the good of the hospital and its long-term mission.

Inviting surgeons to state their opinions and needs can be good. Most surgeons are fair and rational. They will generally support a solution that is in the hospital's best interest if their opinions are heard, and the hospital can explain the direction it is taking. If the review process is conducted properly, the differing perspectives can be brought into harmony and political issues minimized.

Essential versus nice to have

Video integration offers many options: display quantity, size, and resolution; the ability to integrate iPods, XM radio, and hands-free phone calls; live video from other surgical suites; telemedicine; recording options; status boards; light controls; climate controls—the list goes on.

Some projects are straightforward, such as having video recording for one source. Others are more advanced, with an OR permitting up to 6 simultaneous 1080p video recordings for teaching purposes. (1080p is a standard for high-definition video and recording.) Each facility has its own needs, and integration options should be logically assessed. Though some items can be delayed, such as extra wall displays, it is crucial to account for those future needs in the infrastructure planning phase.

Avoid the 'work-around'

Design for the long term and avoid temporary conditions that never seem to be resolved. For example, it's beneficial not to have any electronics, fans, wires, dust-collecting shelves, or noise-producing components in an OR unless absolutely necessary. A good long-term design has an integration electronics rack in a closet adjacent to the OR to house components that typically are not accessed by users. The closet can have its own HVAC (heating, ventilation and air conditioning), power, data, and even the computers used for documentation and retrieving patient information (PACS, etc). The circulating nurse location should be clean and either face the surgical table or be mobile.

Advancing integration technology can assist surgical staff in providing care safely and efficiently. With a good planning process, OR teams can assess where their capabilities are today and look toward the future to see how integration technologies can make the facility more effective and more profitable. ❖