The Big Picture

How hospital needs and the current economic climate have merged to create a potential OR integration solution.

Regardless of the industry, data sharing and management is becoming an increasingly critical issue. In the medical realm, the ability to bring as much information into the OR as possible can produce numerous benefits, not the least of which pertains to patient safety and the best possible surgical outcome. In the end, the goal of OR integration is to achieve a seamless handoff of surgical images and/or video from the OR into the hospital's PACS system, and a secure method for archiving and storing those files for future use.

While the benefits are numerous and somewhat obvious, the primary obstacles stem from IT infrastructure and the costs associated with the latest and greatest technological solutions. In most hospitals, the best image storage systems can be found in the Radiology department's PACS system, where high-resolution, still images are saved and stored with patient data in the DICOM standard.

However, the next step is going beyond a still image to provide video to better understand and address the surgical situation. So as a hospital's existing platform integrates data from the surgical suite into the PACS system from Radiology, the hospital's IT department is tasked with ensuring the hospital's bandwidth can push high-definition video through their existing pipeline, and that the IT capabilities of the facility as a whole can handle video storage.

"Most hospitals aren't equipped for that right now because their servers are set for high-definition images," states Al Richards, Senior Product Manager of TELEMEDICINE at MAQUET USA. "Also, many capital projects have been frozen this year because a lot of hospital's endowments have been hard hit in the last six months," Richards continues. "Hospitals are trying to cut costs however possible. Budgets for the integration component of an OR project are often targeted for reduction, but each year, there are more technology advancements that enable integrators to drive out more costs for basic functionality."

According to Richards, there are plenty of options for hospitals in the form of basic integration systems that allow for video switching between monitors in the OR, most likely without streaming or telemedicine capabilities. These solutions are cheaper, but come with the risk a lower-tier technology that could be obsolete in one or two years. That said, a lower-cost integration solution is often the only answer.

The Solution

Richards and MAQUET hope they've developed a new system that can help address

both the storage capacity and cost concerns central to OR Integration with their new TELEMEDICINE OR integration system. The system began with Lothar Strolo, a man who has been working for years with companies such as Microsoft, IBM and Cisco Systems as a communications consultant.

Specific to the surgical field, Strolo created OTY, a German company that developed AV Conference Premium. This product combines basic video-routing integration with camera feeds, vital sign storage data and patient information into a user-selectable format. Users can utilize a touch screen to pick and choose which data screen appears on which monitor in the surgical suite. Partnering with OTY, MAQUET took AV Conference Premium integration and expanded it beyond the OR, involving the IT and Radiology departments to enhance storage and archiving capabilities.

So with the TELEMEDICINE integration system, videos and images recorded in the OR are sent to the hospital's PACS system to be archived and stored alongside patient data. According to Richards, the process works like this:

- The surgeon can take still images and record video clips during the surgery from any video or camera source, with the ability to take imagery from multiple screens and incorporating it into one video.
- During surgery, these captured images, data and video are buffered in the AV Conference Premium.
- At the end of the procedure, the captured material is reviewed by the surgeon and select images and clips are cleared for archiving or deleted. The remaining files are compiled in the DICOM work list.
- The AV Conference Premium software marries the images with the patient file from the hospital information system.
- This is called 'DICOMizing.'
- The DICOMized information is sent to the PACS system where anyone in the hospital with the proper identification can access the images and print from their desktop, or view the video file.

"The surgeon could record in real time the vitals, respiratory functions and other things going on in different camera angles, and make it one video file," Richards explains. "Later, they can take that file, put it in a PowerPoint presentation and present it, or use it to review and strategize for the next treatment phase of the patient."

Cost Controls

To adjust to the economic times, MAQUET finds it can break its system up into a modular format. "We are trying to develop an option to make our system modular so if an OR wants just basic video switching right now, they can get that, and maybe in next year's budget they can add the streaming and telemedicine capabilities," Richards explains. "But they don't have to buy a new rack or new hardware. We just put in another component and reprogram it.

"We also help them map out their one-, three- or five-year plan for improving the

infrastructure of the hospital IT," Richards says. "That involves the Radiology department because they own the PACS system, the IT department because they build the network and OR Services. They all have three distinctive, separate budgets and command control of their own systems. It's a complicated arrangement, but when we do that, they quickly see that they can not only improve their own individual capabilities and enhance the workflow, but with three departments and three budgets, it's easier to spread these infrastructure upgrades out and make it less painful for everybody."

Simplifying Storage

"We found that we're creating all these still images and HD video clips that, for the most part, people have been saving to USB sticks, burning to DVDs or just printing images in the OR," says Richards. "It opens up some security loopholes as far as HIPAA compliance and patient confidentiality, and it is not really an efficient long-term storage methodology."

This is where consultation is crucial between product experts and hospital staff. "IBM has a very simple but logical methodology of keeping images and video on high-performance hard drives for the duration that the patient is in the hospital, and then they move those to a tape drive that can be re-populated within a few seconds after the patient checks out," Richards states.

"So the hospital can have the capacity for a tremendous amount of data storage over long periods. " MAQUET also brings in companies like Cisco Systems to talk with IT professionals about routing, pipeline enhancement and protection for video traffic, so the hospital's LAN is not bogged down by video streams.

"What we've tried to do is eliminate any security loopholes or gaps so the images from surgery go immediately in a system that's safeguarded with hospital security protocols," Richards says. "There's no need for memory sticks or prints, or any way that a person can take a patient's image or information and send it off to the internet."

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