GOING FILMLESS

IMPLEMENTING AND INTEGRATING PACS

BY TOM SCHAFFNER

Lourdes Medical Pavilion is a physician-owned outpatient imaging center in Paducah, Ky., which lies in a rural county of 64,000 residents.

In December 1998, Lourdes' board of directors gave approval to integrate a picture archiving and communication system (PACS) into the facility. The burden of overseeing this task fell upon Jim Wring, BS, RT(R)(CT), chief operating officer at Lourdes.

"We learned a lot of lessons, not necessarily the hard way, but the rough way," says Wring, referring to the early days of the PACS implementation. "Most of our problems in transition were not understanding workflow issues and how PACS would impact our daily operations." He says that when PACS was in its infancy, there just weren't many people that he could go to for solutions.

Photo courtesy of Land Between the Lakes

The passive waters of western Kentucky seem far removed from the fast-paced world of PACS.

GROWTH TREND IN ULTRASOUND

As a way to ease into the project, Wring decided that ultrasound would serve as the test modality for PACS.

At first the financial numbers were not very promising. In the first year that PACS was installed, the facility's costs increased 44 percent from the all-film environment that previously existed. In year two, cost increase from the all-film environment was only 15 percent.

It wasn't until the third year that Wring started to see the fruits of his labor. "In 2000, we started seeing some of the impact," he says. "Fewer physicians wanted us to print film. We were able to do more procedures with less staffing. Our costs per procedure were down 25 percent. Our expenses now are just about where they were when we first started with PACS."

Wring says that there has been such an increase in the volume of ultrasound exams that the radiology department is now using space in a competing hospital's building to provide ultrasound to patients out of their physicians' offices. "This became possible in part because we have the technology to ship those images around and get the reports to the physicians in a timely manner," he says.

Although the numbers show promise, an obstacle Wring encountered came from the technologists. "Since most of our sonographers were not very computer savvy," Wring says, "they were not eager to change their ways. We had many educational issues bringing people on board. But now, they would not go back to a film environment because their jobs are so much more efficient. They can spend more time with the patients, do more procedures and go home at the end of the day with less stress."

With the success of ultrasound online, the rest of the modalities were phased into PACS: computed tomography, magnetic resonance imaging, computed radiography and mammography.

Wring adds that pre-PACS, Lourdes was averaging just below 0.6 exams per worked hour. It has since climbed to 0.8 exams per worked hour. "We have had a 21 percent volume increase to date and a 7.5 percent staffing decrease," he says.

FOREVER FILM

Considering that PACS' freedom from printing films is a major cost justification for getting PACS, it may be surprising to hear Wring say that Lourdes will never be 100 percent filmless. "You're never filmless. The 'less' part always has to be in parentheses."

He says that physicians' stubbornness to leave film behind is a generational issue. As older physicians retire and younger ones can be educated to the advantages of PACS, Wring says that there will be a greater acceptance of the filmless environment.

Photo courtesy of Lourdes Medical Pavilion

Lourdes Medical Pavilion in Paducah, Ky.

Out of necessity, some type of print capabilities still exist in many medical facilities that have PACS. "You can't tell physicians that they will no longer get films," says Wring, "because they will just go to one of your competitors. Some physicians convert to PACS simply because their competitors are using it. If physicians know that their competitors are looking off CDs, this helps convince them to do the same."

Donald Van Syckle, BSEE, principal of DVS Consulting LLC, in New Berlin, Wis., adds that if problems develop on the PACS system, printing is always a reliable backup.

"You absolutely want to save a lot of money," he says. "You want to tear down a lot of the print capabilities. You don't need to do what you did in the past, but it's still very important for that back-up system. And people still want that film no matter how filmless we say we want to be."

BUYER BEWARE

Purchasing a PACS system is only the first step in the process. Finding a dependable vendor is just as essential. Wring urges that when shopping for a reliable vendor, written assurances are needed from the vendor to ensure the timely response and availability of field engineers in case of problems.

A recent computer malfunction at Wring's facility caused PACS to go down, leaving the radiologists out in the cold. With the service representative responsible for Lourdes' PACS system at least an hour and a half away, the techs were helpless.

"We've had promise after promise from vendors when looking at PACS systems that they would do this and that and keep someone onsite," Wring says. "But if it's not in writing, don't take it to the bank."

When a service rep comes in to fix a problem or make a software upgrade, Lourdes requires that the rep remain on the premises until the staff is confident there will be no immediate issues with the patch or upgrade.

"Don't ever believe an engineer who says the PACS system is on autopilot," Wring says. "PACS is never on autopilot. Any software upgrade that comes along always impacts everything else in some way or another. No matter how miniscule the change may be, make sure that the rep remains at the facility to answer any questions that might arise as a result of that change."

Anita Samarth, of the First Consulting Group in Beltsville, Md., recommends that facilities develop their own acceptance test procedures for their PACS systems. Vendors have good procedures to test their own products to make sure each component is working, she says, but those tests don't measure the integration relating to each facility's specific workflow.

"Take the time to develop acceptance test protocols and include them in your contract and have payment terms tied to those acceptance test procedures," Samarth says. A PACS may have measured up to all acceptance testing protocols before it's been installed, but once the

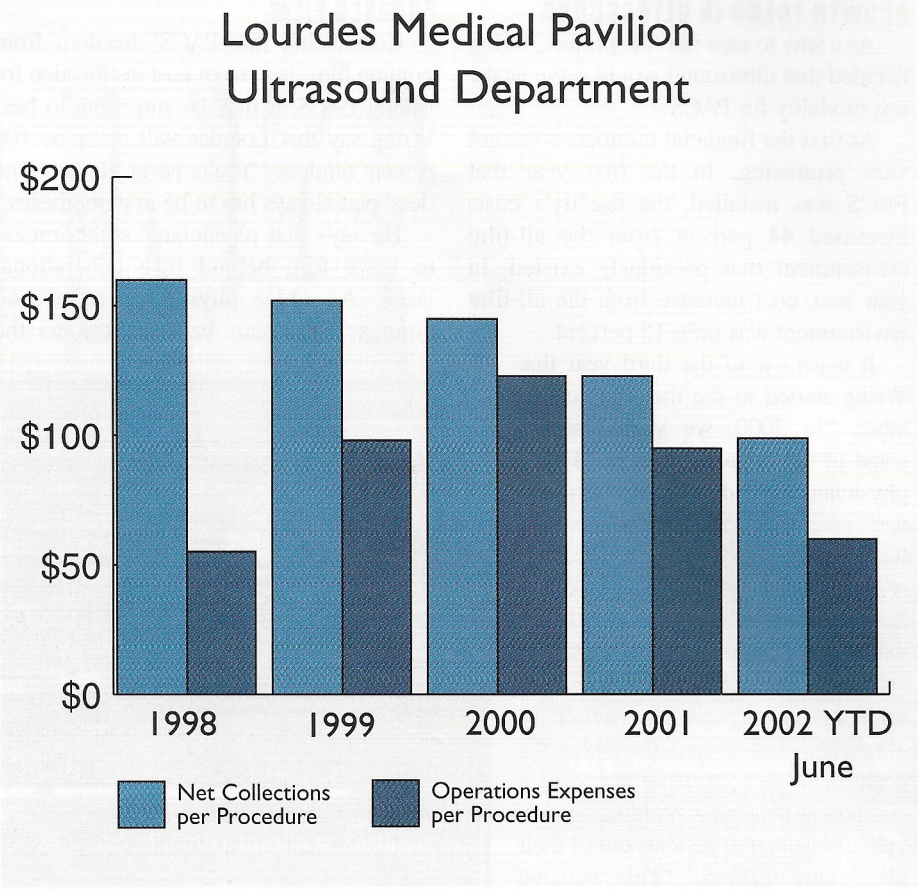
system goes live, an entire new set of problems can arise.

Samarth says that when PACS enters the actual work environment, any integration issues that you didn't think of in advance will probably surface within the first few weeks. "You want to make sure that your radiology information system vendor, your interface vendor and your PACS vendor are still engaged with you through that point. At least to a certain point, you want to have meetings set up so that you still have the responsiveness needed to get those things resolved."

COMPUTER CONCERNS

Van Syckle says that when implementing PACS, cooperation with the information technology (IT) department is essential. Because imaging amasses heavy volumes of data onto the network, there is a greater chance of problems occurring. A good working relationship with IT can make the process a lot easier.

"You can buy the latest and greatest system," says James Keese, BSEE, general manager of Kodak's Professional Services and chief privacy officer for Kodak Health Imaging, Rochester, N.Y., "but if there is a long transfer time for images or information, then the productivity that you thought that you were going to get by going from analogue to digital or even to a hybrid becomes null and void."



Courtesy of Lourdes Medical Pavilion

Keese says that the real financial incentive with PACS lies, not in going filmless, but with the increase in productivity. In the

PACS LINGO

ADT — Admit, Discharge and Transfer (an event type in HL-7)
AE — Application Entity
AIT — Advanced Intelligent Tape
AOI — Area of Interest
ASM — Application Storage Manager
Bit Depth — Number of bits representing each pixel
CORBA — Common Object Request Broker Architecture
DCOM — Distributed Component Object Module
DICOM — Digital Imaging and Communications in Medicine
DLT — Digital Linear Tape
DSL — Digital Subscriber Line (higher bandwidth phone line)
ERI — External Records Interface
HIS — Hospital Information System
HL-7 — Health Level 7
HSM — Hierarchical Storage Manager
IHE — Integrating the Healthcare Enterprise
IOD — Information Object Definition
IP — Internet Protocol
ISDN — Integrated Services Digital Network
LUT — Lookup Table
MOD — Magnetic Optical Disk
MPI — Master Patient Index
MPPS — Modality Performed Procedure Site
MWL — Modality Worklist
NFS — Network File System
NOAH — Neutral Object Application Habitat
ODBC — Object Oriented Database Connectivity
Pixel — Picture Element, fundamental display component of a digital image
RAID — Redundant Array of Independent Disks
RAM — Random Access Memory
RIS — Radiology Information System
ROI — Region of Interest
SC — Secondary Capture
SCP — Service Class Provider
SCU — Service Class User
SOP — Service Object Pair
SPS — Scheduled Procedure Step
SQL — Structured Query Language
SR — Structured Report
TCP/IP — Transmission Control Protocol/Internet Protocol
UID — Unique Identifier
VFS — Virtual File System

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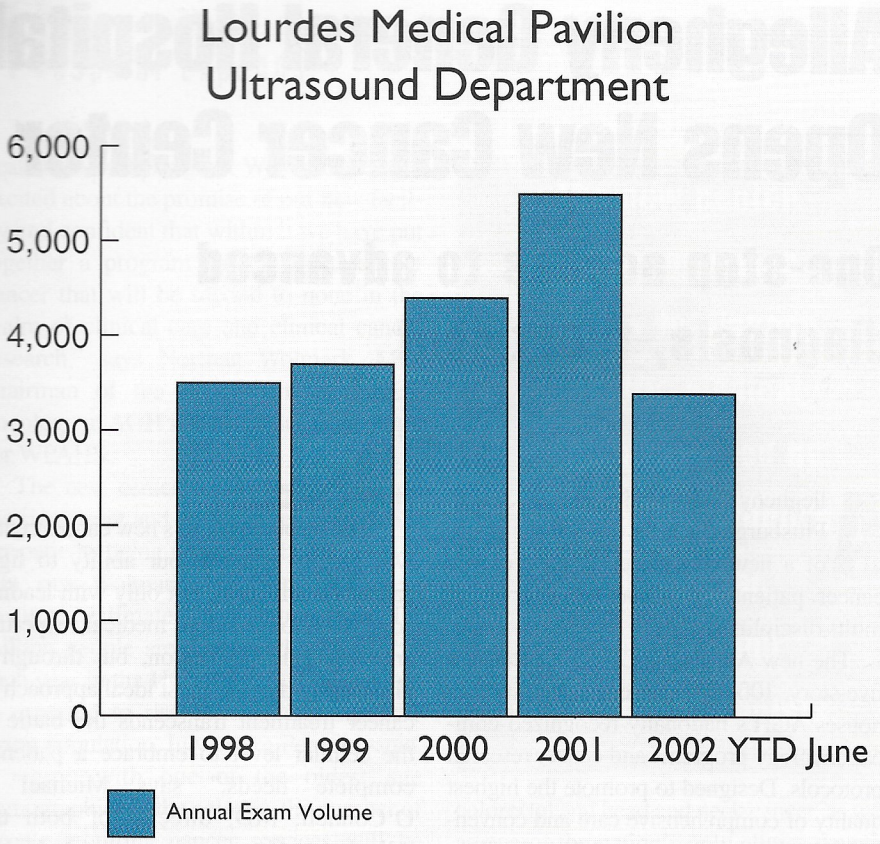

Courtesy of Lourdes Medical Pavilion

past, many vendors have said that digital imaging and migration costs for PACS can be offset by reducing film volumes. "What the industry is finding out is that is not a true case. Pushing the images through faster and processing the claims quicker is really where you are getting your return on investment," he says.

To accomplish this, Keese says it is important to understand the future needs of the facility. IT concerns, such as mission-critical systems, security issues, data migration and telecommunications enhancements, all factor into your new PACS system.

One of the biggest IT areas of concern with PACS is long-term archiving. "You go out and buy an archive for three to five years with one terabyte of data per year to store on this archive," Keese says. "When you get to year two or three, you find out that your tec nology is changing. Therefore you have three terabytes of data that you had on an existing system that could potentially be service-discontinued or product-discontinued because the PC and storage marketplaces migrate rapidly and technologies change."

THE ONLY CONSTANT IS CHANGE

Along with PACS comes some major workflow changes, Wring says. "You don't want to start doing PACS the same way you were doing film." He notes that one thing his facility was not prepared for was the number of quality assurance (QA) stations needed for technologists. Told by vendors that a QA workstation would not be needed at CT or MR, Wring had only one QA station for all his techs. Although the station was centrally located, the CT and MR personnel were on opposite sides of the department, and everyone needed to use it all the time. He quickly discovered that he needed more than one QA station, despite what his vendor had told him.

To avoid similar situations, Wring suggests making site visits and getting input from the technical staff, not the vendors or radiology administrators. The technologists are the personnel who use the equipment and have a better idea of what problems to expect down the line.

"There are no simple changes in PACS," Wring warns. "Every little process change is huge because when everything is connected by computers, and everything that everybody does is dependent on someone else upline entering the right data." For instance, he says that billing software changes will affect the registration software. When an additional registration number or some type of code set needs to be inserted, this changes information that's sent to the PACS.

"With PACS, you will never get to a point where it's up and running, you can put your feet up on your desk and be happy and content," Wring says. "There's no more contentment."

THE COST OF INVESTMENT

"The financial impact of PACS is pretty evident," Wring says, "but the bad news is that the X-rays reveal you have a seriously undersized wallet." Most facilities don't have the kind of budget that can endure the entire acquisition of PACS in one fiscal year.

"You cannot afford not to start making the migration to PACS," he says. "The productivity and cost savings that you'll experience will justify PACS in the long run. The first few years will be rough and your expenses will go up, but if you plan and implement PACS correctly, you will see cost savings and operational improvements."

Wring says that many facilities are prevented from integrating PACS because of the stubbornness of their administrators and board members who can't accept the concept of spending money to save money. However, he does see a silver lining to this dilemma. As more facilities integrate PACS into their organizations, more documentation becomes available to convince decision-makers that PACS is well worth the investment.

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