

## ORTHOPEDIC IMAGING

### Enhancing Productivity Digitally

by Gregg A. Alexander, MD

*The installation of a new digital imaging system has improved staff workflow and patient service at a Florida-based orthopedic clinic.*

We have all heard that a conversion to digital imaging promises increased efficiency and productivity. Our 18-physician practice recently put those promises to the test when we replaced a film-screen system with computed radiography (CR) systems for the digital capture of x-ray images and a Web-based picture archiving and communications system (PACS) for the storage and distribution of CR and MRI examinations. Now we capture and manage digital imaging studies for all of the patients we see in our main clinic, as well as our foot and ankle and spine clinics.



Gregg Alexander, MD, explains the physiology of the spine to a patient with a lumbar injury. The Web distribution system, above, transmits digital imaging studies to PCs in patient examination rooms so that physicians and patients can view images, while discussing diagnosis and treatment.

After almost 9 months of operation, we are pleased to report that we have streamlined our handling of patients and examinations and simultaneously enhanced staff productivity by at least 10%. This new digital workflow has enabled us to accept a growing number of patients with our existing facilities and a smaller staff, which positions us for future growth. Furthermore, we have found that electronic image capture and management save time for everyone involved in the health care delivery process—orthopedic specialists, technologists, staff, and patients.

### CONVERSION PROCESS BEGAN 2 YEARS AGO

The conversion process began about 2 years ago when our staff began evaluating digital imaging vendors and equipment to serve the 28,000 patients we see annually. We interviewed vendors and talked to other users about image quality, ease of use, and, equally important, the availability and responsiveness of vendor support.



Film-based images provide excellent image quality, but many orthopedic practices are converting to digital imaging

We were interested in CR systems that offered both excellent image quality and ease of use. We also wanted the CR vendor to support the digital capture of long-length full-leg and spine imaging examinations. For electronic image access, storage and distribution, we wanted an affordable PACS system that could meet our current and future needs, and a vendor with responsive service and a knowledgeable staff.

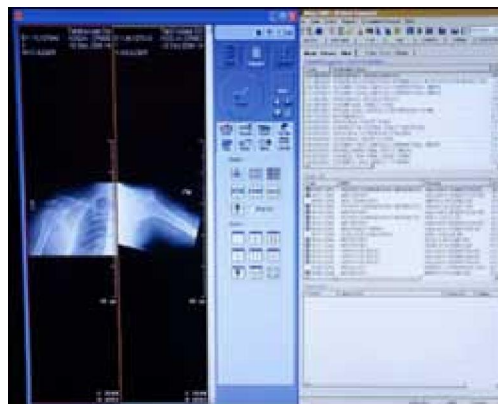
systems, which make these images available in multiple locations simultaneously, and eliminate time-consuming manual filing and retrieval of film studies.

After evaluating three vendors, we selected the same vendor for both CR and PACS systems because of the company's ability to marry affordable, industry-leading equipment with a responsive service organization. We installed CR systems in all areas of our clinic and were immediately impressed by the image quality and the workstation's digital tools that assist with viewing and diagnosis.

## **ELECTRONIC IMAGES AVAILABLE IN EACH EXAMINATION ROOM**

We installed a digitizer in our file room so we can digitize the film studies coming in with each patient and import them into our electronic system. Images captured on-site or digitized are managed and distributed by our Web distribution system.

This Web-based system makes the images immediately available for distribution to five diagnostic workstations and networked PCs in our 53 examination rooms. Our physicians view imaging studies while meeting with patients. This image management system also interfaces with our electronic medical record (EMR) system so we can review a patient's charts and images on the same workstation or computer.



A Web distribution system integrates with the clinic's MISYS electronic health record system to enable the physician and patient to review charts and medical images on the same computer screen.

With a digital imaging system, images are instantly available in multiple locations, while the studies remain securely stored on the PACS. Eliminating manual filing and retrieval of film studies is a huge advantage for any busy orthopedic practice.

## **NETWORKING, INTEGRATION ARE MAJOR CONCERNS**

One of the challenges in converting to a digital image and information management solution is that each practice must have or install a network that can handle the requirements of a PACS. The new PACS must also be integrated with existing imaging modalities and

information systems, such as our EMR system, in order to function efficiently. Being able to produce a digital image is a tremendous advantage, but information management is equally important.

The integration of our PACS with our EMR enables staff and physicians to view patient records and imaging studies on the same workstation. It also allows patient information from the EMR system to be automatically associated with each imaging study. When we enter the patient's identification number, all of their demographic information is automatically associated with each image. This is not only much faster for the technologists, but also eliminates errors that can occur with manual data entry.



CD containing outputs of digital imaging studies for use by patients, referring physicians, and surgeons.

We also created a full-time position for a PACS administrator, which was filled by one of our IT staffers. This person monitors all PACS-related operations, conducts ongoing training, and works closely with our vendor to ensure that we use the PACS to its full potential.

## RETURN ON INVESTMENT

A digital imaging system like ours does not offer an instant payback, but it does deliver immediate benefits and an attractive return on investment.

Our clinic saves almost \$250,000 a year due to the elimination of film-related equipment and reduced staffing requirements. Film expenses account for a savings of \$175,000 and an additional \$13,400 is saved from elimination of processors and chemistry. Because CR and MRI images are now stored electronically on the PACS archive, imaging studies are printed out only for a few neurosurgeons who still request film and for two orthopedic surgeons who conduct surgery at a local hospital that does not support digital imaging. Images are output to CDs for use in the surgery suites of the clinic's outpatient surgery center and a new local hospital.

The clinic has also eliminated two staff positions through attrition for an additional savings of \$58,250.

We would never recommend that a practice undertake a conversion to digital imaging with the intent of achieving an immediate payback. Installing digital imaging is an investment in the future that provides immediate benefits in the form of improved efficiency and patient service. We believe our digital imaging investment is going to benefit our staff and our patients for many years to come.

*Gregg A. Alexander, MD, is the MRI and radiological medical director at Tallahassee Orthopedic Clinic, PA, Tallahassee, Fla.*

[◀ Contents](#)

Search OTR:

[This Issue](#)

[All Issues](#)

[Advertiser  
Index](#)

**Orthopedic Technology Review**

**VOL 7 NO 3**

**MARCH/APRIL 2005**