

UCLA Orthopedic Clinic: Improving Turnaround

Speed, a handy orthopedic package, and the ability to interface with the hospital PACS made ddR the right choice for this orthopedic clinic.

By Rich Smith

Faculty of the department of orthopedic surgery at the University of California, Los Angeles (UCLA), see patients about 42,000 times a year in academic group practice. As part of the care that they provide, the busy group's orthopedic surgeons make extensive use of radiography; monthly volume routinely tops 1,500 studies. Unfortunately, obtaining radiographs in a timely manner was a problem. Sports medicine specialist David R. McAllister, MD, is associate professor of orthopedic surgery at UCLA's David Geffen School of Medicine. He says, "If we needed to have a patient imaged, we had to send that person to the building next door, where the radiology department is located. It could take an hour or more to get those pictures taken, processed, and placed in our hands, which was less than optimal turnaround, as far as we were concerned. We needed images available much faster."

SPEED IMPROVEMENT

Swifter receipt of images meant that orthopedic surgeons could arrive at a diagnosis more quickly (and, just as important, see more patients in the course of a day). The only way for that to occur would be if the orthopedic surgery group were to acquire a radiography system of its own. Having chosen digital radiography (DR), it did precisely that in June 2006 by bringing aboard a Swissray ddR system.

"The images are now in our possession in as little as 5 minutes after we send the patient to our DR suite, just down the hall," McAllister says. It is not merely the speed of

both image production and availability that delights McAllister and his colleagues, however. "Some of the subspecialists in our group need long-leg views and scoliosis views: large-scale radiographs, in other words," McAllister explains. "There isn't a viable DR system on the market that takes an image of the patient's legs from the hips down to the ankles in a single shot, so we were pleased to discover that the Swissray system has a very effective way to produce these large-scale images. What we do is take three separate images at various points along the length of the legs, and then Swissray's image-processing software automatically stitches them together and outputs them as a seamless single image. We don't have significant demand for these long-view images, but when we need them, it's good to know we have the means to produce them."

The UCLA group consists of 19 orthopedic surgeons and one physiatrist. Subspecialties represented by them include joint replacement and reconstructive surgery, hand and microvascular surgery, sports medicine, arthroscopy, foot and ankle surgery, pediatric orthopedics, spinal diseases, orthopedic trauma, orthopedic oncology, and metabolic bone disease. "Our group is consistently ranked by U.S. News and World Report as a top-ten academic orthopedic program," McAllister says. "We're also regarded as one of the top ten residency training programs in the country, and we serve as team physicians for the UCLA Bruins football team." In addition to their ten-room clinic on the UCLA campus, the physicians maintain a satellite facility about 5 miles west, in Santa Monica.

The Swissray ddR earns distinction as the



Long-leg study performed via Swissray auto-stitching software. Image courtesy of David R. McAllister, UCLA.

group's first and only in-office radiography unit. "We acquired our Swissray system with the intention of using a single unit to accommodate all radiographic imaging needs in the office, rather than obtaining several units and dedicating each to a specific type of radiographic study," McAllister says. "It would have been great to have gone that other route, and for a variety of reasons. Trouble was, we have a very limited amount of space in our main clinic, so one Swissray system was all we could physically manage."



Due to limited space, a single Swissray ddR unit was acquired for the purpose of performing all radiographic imaging needs of the UCLA orthopedic clinic.

At the Santa Monica satellite, they still must refer patients to a radiology service whenever images are needed. That could well change, however, over the next several years. The university is in the early stages of building a new medical office complex in Santa Monica, and the orthopedic surgery group's satellite will relocate to this new facility when it is ready for occupancy sometime in 2009. Plans call for setting up no fewer than three in-office DR suites there. "We'll probably designate one, or maybe two, of those rooms for specialty imaging," McAllister says.

INFORMATION MANAGEMENT

Interpretation of the DR images produced by the Swissray sys-

tem is normally performed by the orthopedic surgeons themselves. There are, however, occasions when the radiology department is asked to consult. Doing so is easy because the orthopedic surgery group's DR images reside within radiology's enterprise-wide picture archiving and communications system (PACS). "The images in question can be called up by the radiologists in a matter of seconds when we need a consult," McAllister says.

Whereas the radiologists view the DR images at a PACS workstation, the orthopedists rely on Internet-connected computer monitors. They also have access, at their computers, to some of the same PACS image-enhancement tools that the radiologists use to adjust contrast and zoom in or out to improve the view of areas of interest. "We don't really need to do anything along the lines of retouching our images or rotating the view perspective, though," McAllister says.

Text data, such as patient demographics, are automatically merged with the DR-generated images through an electronic interface with the orthopedic group's appointment-scheduling system. "An accession number is created to go with the patient's name, date of birth, and medical-record identification number," McAllister says. "Our group is not yet fully electronic, but this has moved us much closer to that."

One of the reasons that UCLA's orthopedic surgeons chose Swissray was for its innovative detector technology. Some Swissray models employ the dOd-HD-16, a 16-bit, high-definition detector with four charge-coupled devices. In addition to superb image quality (it produces more than 65,000 grey levels), the dOd-HD-16 is said to deliver the lowest radiation dose of any radiographic method. Other Swissray models are built around the company's flat-panel FP-5000 very-low-dose detector, which features a five-field measuring chamber and achieves spatial resolution of 3.5 lp per mm (the FP-5000 blends amorphous-silicon technology with a cesium-iodide scintillator to generate image pixels of 143 μm in a 43-cm-square format).

"We went with Swissray," McAllister says, "because it was capable of delivering what we needed: high-quality digital images, fast throughput, and compatibility with the radiology department's PACS. In fact, the radiology department asked us to be sure that the DR system we eventually settled on would be able to integrate with their PACS."

McAllister says the equipment has proved remarkably easy to use. "We found that Swissray offered some very nice features, such as an automated positioning system, that would help our in-office technologists produce studies exactly as we needed them

produced, but without having to go through a lot of time-consuming, complicated steps," he says. With Swissray, all exposure and image-processing parameters can be chosen by means of simple touch-screen selections. Further, Swissray uses advanced robotics to position the system with pinpoint accuracy. As an added measure, the system features a collimator-mounted video camera that sends an optimal view of the patient back to the technologist seated at the control desk. This direct visual link helps ensure that the technologist will correctly capture images while providing maximum security for the patient.



The Swissray ddR unit easily integrated with the radiology department PACS.

ORTHOPEDIC PACKAGE

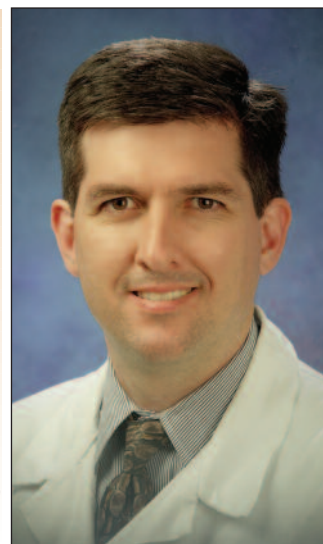
The Swissray ddR[model] system acquired at UCLA came with an orthopedic-specific imaging package, anchored by Swissray's proprietary stand, which includes a weight-distribution indicator to provide positioning feedback so that weight-bearing examinations can be performed with the greatest precision possible. Patient weight and height data are automatically transmitted from the stand to the system using wireless technology; these are then used in the automatic calculation and correlation of body mass to

permit application of an optimized set of imaging techniques and algorithms to the specific examination.

Swissray also makes available a companion package for conducting bone mineral density studies. It features software algorithms that automatically analyze a digital hand radiograph to measure bone mineral density; the company claims its sensitivity to be 95%, and its specificity, 99%.

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—David McAllister, MD



The group's joint-replacement and spine specialists have procured a basic package of implant-planning templates. "Previously, for implantation planning in joint and certain spine cases, they had to print a film and overlay it with a conventional physical template," McAllister says. "They wanted to be able to do templating in an entirely electronic mode so we could avoid having to print films." The limitation to this add-on is that it only is usable at a dedicated PACS workstation. McAllister says the group probably will soon upgrade to a templates package that allows the work to be performed on any computer.

One other consideration that led the UCLA group to choose Swissray was the company's service support. "When we were shopping for a system, colleagues at other facilities where digital radiography is in use urged us to look at the quality of the technical backing we could expect from the vendor," McAllister reports. "They warned us that a number of vendors out there offer a good product, but not good service support. In Swissray, we found a vendor that offered both."

McAllister and his group partners were frankly glad about that. "There were a few minor technical issues we had with the installation, but Swissray was very responsive to our requests for assistance," he says. "They gave us everything we needed to get up and running quickly. Overall, today, the system is working very well for us. We're very pleased. In terms of generating high-quality images in a timely fashion, it's doing exactly what we wanted and needed." ■

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