

Touro Infirmary: Digital Acquisition and Robotics Speed Throughput

In the wake of Katrina, DR is helping this New Orleans hospital deal with the deluge of patients

By Rich Smith

For the better part of a month after Hurricane Katrina caused the levees protecting New Orleans to burst and flood the city, every hospital was closed. Touro Infirmary was no exception, even though the rising waters came to

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Hurricane Katrina devastated the New Orleans health care infrastructure.

a halt mere feet from the venerable facility's front door. It took 30 days to restore power and water to Touro and to make a small part of it usable again. When both the electricity and

emergency generators had failed, so had the air-conditioning system, and this allowed ruinous condensation to form and saturate the interior. Within 9 months, the hospital was fully back in business.

The same could not be said, however, for most of the other hospitals in the various parishes around New Orleans. They did not escape the flooding, and suffered far worse structural damage. For the most part, they remain shuttered, more than a year later. As a consequence of those continued closures, Touro has been inundated with patients who have nowhere else to turn for the care that they need. This is straining Touro's resources, but in no department is the spike in demand for services more strongly felt than in radiology. The good news, though, is that the imaging team is less hard-pressed than could otherwise have been the case because the facility is now using high-throughput digital radiography (DR).

Jimmy Hitzman, CRA, administrative director of radiology, says, "The gain in throughput with DR is dramatic. DR offers the potential of at least doubling the amount of imaging you can handle in a day, compared with what you can do with analog. Because of that, my staff isn't overwhelmed by the workload, so no one feels like giving up and looking for a job in a less busy hospi-

tal in a part of the state that wasn't hit as bad as us. Staff retention is really important because, right now, we need every hand we can get."

STORIED FACILITY

Touro Infirmary, New Orleans' only not-for-profit, faith-based, full-service community hospital and a U.S. News and World Report top hospital, first opened its doors in the mid 1850s. It was founded by Judah Touro, who pledged to apply the principles of Judaism in providing health care. Thus, philanthropy has always been at the heart of the Touro Infirmary's mission. So has vision: in 1923, for instance, Touro was one of only 15 hospitals in the United States that were approved to use insulin to treat diabetes. Years later, it was among the first to have a physical therapy department (which now operates as the Touro Rehabilitation Center and ranks among the best US rehabilitation facilities). Fully accredited by the Joint Commission on the Accreditation of Healthcare Organizations, the hospital enjoys academic affiliations with Louisiana State University Health Sciences Center and Tulane University Health Science Center.



Touro Infirmary installed three ddRFormula machines to assist with increased workflow.

The hospital's department of radiology is made up of five staff radiologists (three generalists and two neuroradiologists), supported by technologists specializing in each of the various modalities (21.4 full-time equivalents in diagnostic radiology, 7 in CT, 4.1 in ultrasound, 2.2 in MRI, and 3.2 in nuclear medicine). In a normal year's time, the department, which is focused on diagnostic imaging (although it supports the interventional work of the cardiology department), conducts approximately 100,000 imaging procedures.

Of course, having been around as long as it has, Touro Infirmary has experienced its share of major hurricanes, but none quite like Katrina in August 2005. "In radiology, we lost

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two nuclear cameras, two portable C-arms, two fluoroscopy rooms, and two radiographic rooms, all due entirely to the condensation problem caused by having no air conditioning," Hitzman reports.

RENEWED SIGNS OF LIFE

To get the radiology department at Touro back up and running after the hurricane required long weeks of testing and recalibration of the equipment that had survived. "We had to demonstrate that our systems were safe and functional at a level equal to, or better than, the condition they were in prior to the storm," Hitzman says.

The first Touro Infirmary department to reopen and begin accepting patients was the emergency room; it went live a month after the hurricane. As other units of the hospital, in steady succession, came back to life, Hitzman worried that his still-hobbled department might not be able to handle the predicted volume of cases. Fortunately, demand for imaging services did not immediately jump, since most residents of New Orleans had been evacuated from the city (and many were in no hurry to return). The trickling home of the displaced populace gave the radiology department additional time to regain its footing by hastily acquiring replacement equipment.

Actually, the acquisitions were not made on the fly. Prior to Katrina, the hospital had planned to replace five of its seven analog radiography systems with state-of-the-art DR machines (the other two were to be replaced with computed-radiography units). This was scheduled to take place incrementally, over a 5-year period. With some of the analog systems damaged beyond hope, however, the department decided to truncate the timetable so that most of the purchases would occur in 2006. "The hospital gave me permission to buy one new digital machine for every old analog system that no longer was in operational condition," Hitzman says. "Our first DR arrived in June 2006, followed by a second in September and a third in October."

GOOD CHOICE

All three of the newly acquired DR machines were made by Swissray and are the same model: the ddRFormula, Swissray's latest innovation in DR systems. The ddRFormula incorporates the company's FP-5000 very-low-dose detector, noteworthy in part for its ability to deliver spatial resolution of 3.5 line pairs per mm. This is possible because the detector combines amorphous-silicon technology with a cesium-iodide scintillator and boasts an architecture that includes a five-field measuring chamber. Other design characteristics of the system keep the x-ray tube centered, at all times, on the detector.

The ddRFormula also is said to be the most extensively automated DR product on the market: system movements are fully motorized and software controlled. In addition, the ddRFormula comes with a novel positioning stand that uses wireless technology to relay patient weight and height information to the technologist's workstation so that body-mass calculations can be automatically made. The system computes and then self-correlates those data in ways that allow examination-specific optimization of the imaging algorithms and techniques, the result being greater precision in the performance of studies involving any degree of weight bearing.

Hitzman says that the biggest difference in using DR is the obvious one: no more need for a dark-room, despite the fact that the department, for the time being, prints digital images on film. Even so, "The technologist is able to view the image within seconds after the exposure is made," Hitzman says. "If the positioning and technique are incorrect, we can immediately reshoot without losing any time. Robotics play a big part in this, too.

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If we're doing a chest radiograph, for example, the system automatically sets itself up in that format (another time saver). All of the exposure and image-processing parameters are easily selectable."

READY FOR NEXT TIME

DR is still relatively new at Touro Infirmary, so the full measure of faster throughput has not yet been achieved. "To some extent, that's because we're still working our way through the

learning curve with these new machines," Hitzman explains. "The staff, when they first caught sight of our initial DR unit, had sort of a deer-in-the-headlights look, but they've quickly adapted, and now they love working with it."

Hitzman continues, "We won't see the true potential of DR, in terms of speedy throughput, until we acquire a picture archiving and communications system (PACS), which is scheduled to be brought aboard at some point in the coming months. Because we're still having to take the step of printing films, it



Touro Infirmary used lessons learned during Hurricane Katrina to devise an emergency action plan.

slows down the throughput. With PACS, we'll be able to stop making films and can view images on workstations and computer monitors. Our expectation is that, once everyone is completely trained on the DR system and we get PACS installed, we'll see the kinds of throughput these systems are capable of achieving."

Touro Infirmary has used the lessons learned from its experiences during and after Katrina to devise an action plan aimed at helping prevent a repeat of problems in the event the city is, one day in the future, hit with another category-3 or higher storm that threatens the city's elaborate system of levees (broad sections of New Orleans are below sea level).

"Our emergency generators failed during Katrina because they were older technology, so the hospital has installed a new system of advanced backup-power generators that will keep the lights running and the air conditioners operating," Hitzman notes. "We've also dug a 244-m well to keep the hospital supplied with potable water in the event the city's water mains are damaged and we're cut off. We revamped our entire emergency preparedness plan, and we've already had a number of drills on it to make sure everyone knows his or her part and that all our systems check out. We're ready for the next big hurricane. We're ready to keep serving the people of New Orleans." ■

Rich Smith is a contributing writer for Imaging Economics.