

Mobile CT device avoids hazards of ICU scanning

Neurologica's eight-slice CereTom goes to patient yet produces images comparable to stationary systems

Nothing wreaks havoc on a CT schedule like a patient from intensive care accompanied by monitors and attended by several nurses. A simple head scan can take 45 minutes to an hour. And that's if everything goes according to plan. Throw in a cardiac arrest, and what was a challenge can quickly become a disaster.

Neurologica, an imaging company based in Danvers, MA, has a way around the problem: Bring the scanner to the patient.

The company's solution, CereTom, acts more like an ultrasound scanner than a CT. At four feet tall and 29 inches wide, the eight-slice CT, which is essentially a gantry on wheels, can be rolled down a corridor. It fits through any hospital doorway and shimmies up to a hospital bed to perform the same kind of scans as a full-fledged premium scanner, from perfusion imaging to CT angiography.

"It takes care of the hotspots in the hospital: the ICU and the ER," said Dr. Christoph Wald, director of advanced image analysis and virtual surgical planning at the Lahey Clinic in Burlington, MA.

CereTom provides the information that is critical to the effective management of patients suffering brain trauma yet often lacking in acute care. Tissue plasminogen activator, for example, can alleviate stroke symptoms by restoring blood flow to ischemic brain tissue, but tPA helps only if the ischemia is due to blocked arteries. It worsens the condition of patients with hemorrhage.

Promptly identifying blocked cerebral arteries, therefore, is critical to effective treatment. But many hospitals have limited access to CT, sometimes because they cannot afford the necessary equipment. In other instances, staffers are not available to run the CT machines. Even when the resources are available, scanners bolted into the radiology department present difficulties.

"We are a big tertiary-care center with a very busy CT department," Wald said. "It is an absolute nightmare when a patient has to travel with a ventilator and four nurses, and you're trying to get the patient on the scanner table and tape everything down and make sure the tubes are long enough and the patient is all right."

CereTom may be the answer, according to Eric Bailey, president and CEO of Neurologica. At \$250,000, the ultraportable scanner is within the budget of virtually any medical facility. It is small enough to get where it's needed, and it plugs into a standard wall outlet. When power isn't readily available, CereTom runs off a battery

powerful enough to handle eight or more exams without recharging. Data can be downloaded by Ethernet cable or through a wireless connection to a laptop.

Designed specifically to scan patients suspected of traumatic brain injury, CereTom has been a hit mostly with hospitals looking for CT coverage in ICUs and ERs. More than 30 of the systems were operating in the U.S. at the end of 2006, with another half-dozen shipping each month.

The Lahey Clinic was among the first to acquire one. The system was dedicated for use in its various ICUs, which are spread across several floors of the sprawling facility. The medical center has since purchased a second unit for the ER. Both spend their off-time in the radiology department. When needed, the devices are rolled by radiologic technologists to the patient. A dedicated CT tech is not necessary.

"This is so simple you can train any radiologic technologist to do it," Wald said.

ICU patients are scanned in a 25-cm field-of-view accessed from their beds without having to detach the tubes and monitor leads typically running to and from ICU patients. A board slides under the patient's head so it can be positioned in line with the gantry. Tread track resembling what might be found on a miniature bulldozer draws the gantry to the patient rather than the other way around, eliminating the need for a separate patient bed. Voxar software on the scanner's laptop turns the data into 2D, multiplanar, even 3D surface and volume renderings.

The versatility of the unit knows few bounds clinically or geographically. Although designed specifically for the adult head and neck, the low-dose CT is a natural for pediatric applications, Bailey said. It requires no x-ray

shielding, which is why CereTom works so well in the ICU and ER—and why it may be suitable for dental and maxillofacial surgery offices.

Its small size means the scanner can travel anywhere in the hospital or clinic or beyond. To make this point, Bailey plans on mounting one in an ambulance at the International Stroke Conference meeting in San Francisco in February.

CereTom should be in Iraq and Afghanistan, scanning troops with head trauma from shrapnel or, if protected by armored vehicles, the percussion from an improvised explosive device, he said. Bailey has shown it to the British military, which is considering the purchase of eight units. The U.S. military, however, does not seem interested, and Bailey does not know why.

"I could bring this to the battlefield," he said. "It wouldn't need the air-conditioned environment or clean power source that a conventional CT needs."

In the months ahead, CereTom will be mostly deployed in the U.S. and increasingly in Europe, as the company takes advantage of its recent CE marking.

Meanwhile, Bailey is looking to extend its clinical application from trauma to the operating room, a transition that might be made easier by a radiolucent cranial stabilizer the company is developing jointly with ProMed Instruments in Germany. The device, shown as a work-in-progress at the RSNA meeting, is designed for intra-operative scanning, when surgeons need to account for brain shift due to the removal of tumor.

"When neurosurgeons learn they can get a CT scanner to image their patients anytime during surgery for this kind of money, and then we tell them it will work with Medtronic and BrainLab (navigation systems), they are going to do back flips," Bailey said. ■

—By Greg Freiherr



Neurologica's portable CT scanner can be wheeled to the patient bedside to scan the brain. The CereTom system, released commercially about one year ago, is used primarily in the ICU and ER. (Provided by Neurologica)