

UT Southwestern unveils next generation CT scanner that views whole organs in a heartbeat

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Drs. Phil Evans (left) and Michael Medina, assistant vice president for health system imaging services, are overseeing the installation of the Aquilion One CT scanner. Credit: UT Southwestern Medical Center

UT Southwestern Medical Center is the first site in North Texas to launch the next generation in CT scanners, which allow doctors to image an entire organ in less than a second or track blood flow through the brain or to a tumor - all with less radiation exposure to patients.

Aquilion One dynamic volume computed tomography (CT) can create a

detailed 3-D movie of an organ in real time. That makes it particularly useful for quickly diagnosing strokes and heart attacks, for example, where diagnostic speed can be a critical factor in survival and recovery.

Because the machine's technology can take continuous or intermittent images, UT Southwestern radiologists anticipate better visualization in neurology, trauma, whole body, lung, cardiac, vascular and pediatric studies. Other applications include providing distinctive capabilities in orthopaedic and joint studies, diagnosing [renal function](#), and even vocal-cord analysis.

For patients, the new technology can mean less time in a scanner and less exposure to radiation, said Dr. Phil Evans, associate vice president for clinical imaging and professor of radiology.

"Dose has been a concern in the medical literature for a long time and people have been very concerned about it," said Dr. Evans, who directs UT Southwestern's Clinical Imaging Services. "One of the great things about this is that you can do a scan with about half the [radiation dose](#) and half the contrast media, so the dose is less and the image is better."

Other scanners piece together strips of images to compile a complete picture, using four-, 16-, 32- or 64-slice machines. Aquilion One, manufactured by Toshiba, exposes patients to less radiation because one strip covers a larger area, therefore requiring fewer swaths overall and less time. The result can be as much as 80 percent less radiation in some cases, according to published research.

Aquilion One uses 320 high-resolution X-ray detectors in each rotation. What takes 12 to 15 seconds for other scanners to complete takes only about a third of a second for the 320-slice machine. Aquilion One can take images continuously or intermittently, allowing doctors to see the heart pumping, or blood or medication working through the vascular

system.

"One of the most exciting things about this technology is the real-time ability to image changing anatomy," said Dr. Phillip Purdy, professor of radiology and neurological surgery. "We have been able to image physiology such as [blood flow](#) in parts of the brain, but now we can image the entire brain faster and more safely."

The faster speed may also mean less required contrast materials and can also benefit patients who have difficulty remaining still, such as children, the elderly and trauma patients.

Using Aquilion One, UT Southwestern physicians said they will be able to accurately diagnose a stroke or [heart attack](#) in about 20 minutes, as well as be able to gauge tissue damage.

Currently, doctors often perform a battery of tests to confirm a heart attack - an EKG, CT angiography, nuclear testing and catheterization - which can take hours or even days.

Other clinical applications include patients who can't get an MRI due to the presence of a pacemaker, or vocal-cord analysis capturing a patient phonating. The machine provides added flexibility in properly positioning patients with trauma or disabilities, and is sturdy enough to accommodate obese patients.

UT Southwestern physicians also anticipate the Aquilion One device will be valuable in many of the medical center's unique research projects. For example, the ability to move backward and forward in time through the images may help researchers to visualize better the effects of tissue damage or vascular flow.

"This has the potential to impact the daily medicine we currently

practice and help us identify future clinical pathways," Dr. Evans said. "UT Southwestern is fortunate to have clinical experts and forward-looking researchers who will really be the ones to determine its best uses.

Technology, even the best technology, still depends on the expertise of those using it."

Provided by UT Southwestern Medical Center

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