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3-D mammography offers better images, earlier detection, fewer false positives

Tomosynthesis is only available at Parkwest

If you are one of the nearly 40 percent of women who have "dense" breast tissue, then the 3-D digital mammography is for you. In Knoxville, tomosynthesis (a.k.a. 3-D digital mammography) is only available at Parkwest Medical Center.

Women whose breasts are comprised of less fat and more glandular tissue have "dense" breasts, according to doctors. On a mammogram, this dense tissue appears white. Cancerous tumors also appear white, making it very difficult sometimes to see the tumor. In comparison, a fatty breast is radiolucent, meaning it produces a dark background which makes a small, white tumor much easier to see.

"It's like looking for a single snowflake in the middle of a snowstorm," said Parkwest radiologist Amanda Squires, M.D., describing the difficulty of finding cancer in a dense tissue breast with a regular mammogram. "With traditional mammography, we only have the two images of each breast. With tomosynthesis, we can scroll through the series of images, much like watching a movie. It gives much clearer images and more of them to work with. Tomosynthesis makes it easier to detect cancer early and also allows for fewer false positive results."

Digital tomosynthesis creates a 3-D picture of the breast using X-rays. It is different from a standard mammogram in the same



way a ball differs from a circle. The ball is 3-D; the circle is flat.

Two-dimensional mammography usually only takes two X-rays of each breast from different angles: one from top to bottom and one from side to side. The breast is pulled away from the body, compressed and held between two glass plates to ensure that the whole breast is viewed. The compression also causes overlapping of the breast tissue. A breast cancer can be hidden in the overlapping tissue and not show up on the mammogram. 3-D digital mammography eliminates this potential problem.

"It's like looking for a single snowflake in the middle of a snowstorm."

- Dr. Amanda Squires, describing the difficulty of finding cancer in a dense tissue breast with a regular mammogram

Digital tomosynthesis takes multiple X-ray pictures of each breast from many angles. The breast is positioned the same way it is in a conventional mammogram, but only a little pressure is applied — just enough to keep the

breast in a stable position during the procedure. The X-ray tube moves in an arc around the breast while 11 images are taken during a seven-second examination. Then the information is sent to a computer, where it is assembled

to produce clear, highly focused 3-dimensional images throughout the breast.

"Tomosynthesis builds upon the success of existing mammography," Squires said. "Over time, we expect that 3-D mammography will become the new standard in breast cancer screening and detection."

Squires said the radiation dose for the combined exam (standard mammogram plus tomosynthesis at the same time) is essentially equivalent to the prior non-digital mammograms that were used for more than 30 years.

The study is completed in about five minutes which is much faster than whole breast ultrasound. The FDA thoroughly considered the radiation issue before approving tomosynthesis for use in screening and diagnostic exams and ruled that the benefit of the additional information available to the radiologist outweighs any potential risk.

For now, tomosynthesis will be used as a complement to existing mammography and will be performed along with a conventional mammogram — at the same time on the same scanner. This technology is currently being performed at facilities such as Duke, Emory, Harvard, Johns Hopkins and Yale.

While it has received FDA approval, 3-D mammography is not yet covered by all insurance plans. The cost of the procedure is \$125. For more information or to schedule an appointment, call the Parkwest Comprehensive Breast Center at 865-373-7010.



Should I get an ultrasound instead of tomosynthesis?

Parkwest does not perform ultrasound to screen for breast cancer because there is tremendous overlap in the appearance of small breast cancers and normal breast tissue which makes definitive diagnosis difficult. This results in a false sense of security when a negative result is obtained and undue alarm, anxiety and patient expense when benign areas are identified and biopsied. Also, some of the earliest forms of breast cancer can only be seen using mammography. Experts agree that mammography currently provides the best balance in early identification of cancer while not falsely alarming patients.

For questions about tomosynthesis or ultrasound, visit www.TreatedWell.com or call 374-PARK.

What is breast density?

Breast density refers to the amount of fat and tissue in the breast as seen on a mammogram. A dense breast has more tissue than fat. Younger women usually have dense breasts. As women get older, their breasts become less dense. After menopause, breast tissue of most women is replaced by fat. Some older women who use postmenopausal hormones may have higher breast density, though, until they stop using hormones.

Why is breast density important?

Women with dense breasts have an increased risk of breast cancer. Unfortunately, we don't yet know why breast density is related to breast cancer. Research is ongoing.

Screening for women with dense breasts

Dense breasts make it difficult to detect breast cancer on a mammogram. Dense breast tissue can look white or light gray on a mammogram and cancer can also look white or light gray. As a result, mammograms may not be as effective in women

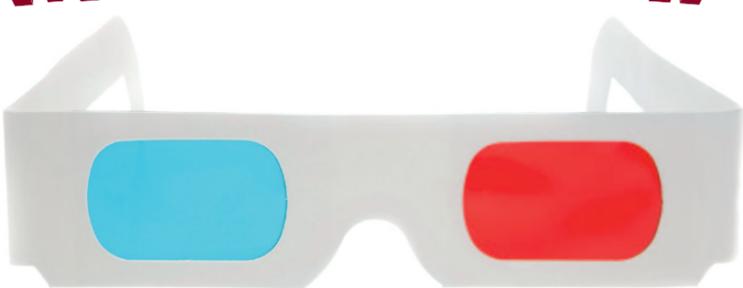
with dense breasts. Mammograms are most effective when the breast has more fat than breast tissue, making the mammograms of most postmenopausal women easier to interpret.

Mammogram images can be stored on film (standard mammography) or on a computer (digital mammography). For women with dense breasts, digital mammography may be better than film mammography. Tumors in women with dense breasts may be easier to find with digital mammography than with film mammography. A digital mammogram can be lightened, darkened or enlarged, possibly showing tumors that would otherwise be hidden. Digital mammogram images can also be sent to other locations for evaluation. In the future, new technology may provide better imaging of dense breasts. Magnetic resonance imaging (MRI), in combination with mammography, is currently under study as a breast cancer screening tool for women with dense breasts.

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3D MAMMOGRAPHY



**BETTER IMAGES
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