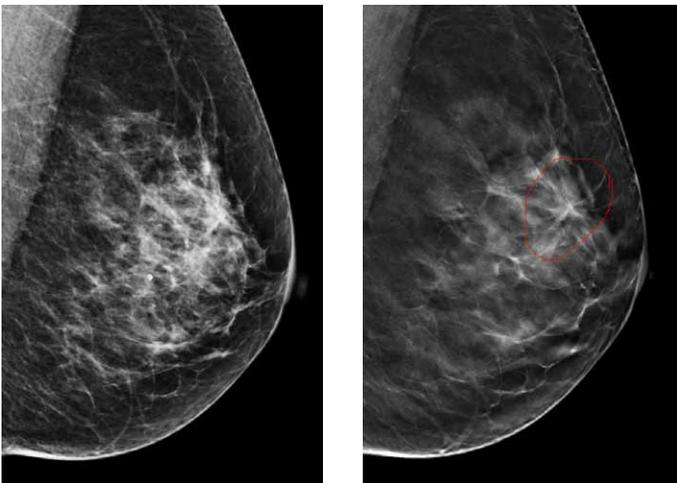


A game changer for breast imaging

Now Open: 3-D Mammography in the Breast Center

Lara Hardesty, MD, sat late last week in a darkened radiography reading room in the University of Colorado Hospital Breast Center. In front of her at a diagnostic workstation was a gray-and-white image of a breast, set against a black background.

At the center of the image was a swirl of white – dense glandular tissue, explained Hardesty, section chief of breast imaging. To Hardesty's well-trained eye, the opaque mass was troubling. It looked like cancer might be lurking within it, but she couldn't tell because she was looking at a two-dimensional image of the breast. Looking at the cloud without entering it, she was unsure what it contained.



The two-dimensional image on the left shows a mass of white in the breast. The three-dimensional image on the right shows a circled area (right center) with a tail, an indication of cancerous tissue.

Less than a month ago, Hardesty would have had to call the patient back in to get additional views of the breast through spot compression tests and ultrasound. But that's changed, thanks to a new, half-million-dollar mammography system that produces three-dimensional images of the breast. Today, she and her colleagues can very often find the answer to questions like this one without additional testing.

In breast tomosynthesis, as it's called, an x-ray beam moves through the breast in an arc, Hardesty explained. The process creates a series of images the system stores in a single packet of data. When it's time to read the mammogram, the system "reslices" the packet into a series 1-millimeter-thick images.

Sitting at a control panel that looks like one from a home video game, Hardesty rolled through images of a different patient's breast, one that viewed initially in two dimensions had appeared to be normal.

"We're actually walking through the breast," she said. And indeed, in the sample image, she saw a white dot with trailing flares, a sign of cancerous tissue extending into normal tissue. In the two-dimensional image, tissue overlying it had obscured her view.

Two-pronged advance. "I think it's game-changing for breast imaging," Hardesty said. The technology from Bedford, Mass.-based Hologic Inc., received Food and Drug Administration approval in February 2011 after trials that showed it detected cancers at least as well as other machines while it helped to reduce the number of women who had to be called back for additional exams by 40 percent.

"The most common criticism of screening mammography is that women often have to be called back for extra views," Hardesty said. "It's an anxiety-producing experience."

Most new technology, she added, either improves detection of disease or improves the accuracy of diagnosis. "The problem is that when we're able to detect disease earlier that also means more false positives," she said. "The 3-D imaging means we'll not only find cancers earlier, we'll also have fewer false positives."

To illustrate, Hardesty showed another two-dimensional image, this one containing a white spot with a long tail, again an apparent sign of cancer. But when she rolled through the three-dimensional image to the same spot, the tail no longer appeared. It had merely

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seemed to be a part of a mass when viewed without benefit of a third dimension – much as a stream of jet exhaust, seen from the ground, might appear to be part of a cloud.

“That’s a patient we would have had to call back for additional testing if she had not undergone tomosynthesis,” Hardesty said.

Hardesty, her fellow radiologists and radiology technologists each completed eight hours of tomosynthesis training last month. “We reviewed lots of cancers,” she said. “I found it easy to use and intuitive, more so than other imaging technologies. I was most excited to see and understand how it’s going to help patients.”

For now, the Breast Center has one of the new machines, purchased with funds donated by the Men for the Cure Foundation. The clinic will use it for screenings, while women will get the much lengthier diagnostic workups on the two-dimensional digital mammography machine.

“We decided it would be more beneficial to use the new technology for screenings,” Hardesty said, “because more women will be able to benefit from this new technology and because it will help us to decrease the number of women we have to call back.”

– Tyler Smith