Iowa Radiology

Should I Get a Low-Dose 3-D Mammogram?

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What is low-dose 3-D mammography?

Standard mammography relies upon two-dimensional X-ray images of the breast to detect possible areas of concern. 3-D mammography, or tomosynthesis, is a process that incorporates many X-ray images taken from a range of angles to create a three-dimensional image of the breast that can be closely examined a millimeter at a time. In the past, this process combined 2-D and 3-D exams, which meant that patients received a higher radiation dose during mammography screening. Hologic's C-View software allows both sets of images to be taken simultaneously, allowing for quicker procedure times and lower radiation doses than previously possible.[1]

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How is it different from traditional mammography?

The computer can translate 3-D tomosynthesis images into 2-D pictures that are clearer and more detailed than those generated by a traditional 2-D mammogram. This allows radiologists to view a much more detailed picture of breast tissue. The appearance of linear structures, radiating lines, and architectural distortions that can indicate malignant masses, is enhanced with tomosynthesis.[2]

What are the advantages of low-dose 3-D mammography?

3-D mammography allows for more accurate diagnosis of masses, distortions, and variations in density than standard mammograms, especially in women with dense or fibrous breasts—those having a higher percentage of fibrous or glandular tissue versus the percentage of fatty tissue.[3] Research has linked higher breast density with higher breast cancer risk as well as more aggressive tumor characteristics,[4] so increased vigilance in detection is even more vital in women with denser breasts.

Getting the clearest picture possible is especially important for women with dense breasts because both dense breast tissue and tumors appear white on traditional X-rays. This makes it very difficult to identify cancerous abnormalities. At the same time, it can make benign breast features appear suspicious, resulting in costly (and often stress-inducing) follow-up tests. A retrospective study of more than 1,000,000 women published in 2023 found that compared to traditional digital mammography, the addition of tomosynthesis resulted in more than a 13% reduction in callbacks and an approximately 18% increase in cancer detection.[5]

At Iowa Radiology, we're proud to offer the Genius 3-D exam with the option of SmartCurve compression paddles. Pain is the most common complaint about mammography procedures, and nearly eight out of every ten women report pain during a mammogram.[6] The SmartCurve compression device mirrors the shape of the breast to reduce pinching and deliver uniform pressure over the entire breast. The result is that SmartCurve has been shown to increase comfort for 93% of women who report moderate to severe discomfort from standard mammography technology.[7] Because every woman's body is shaped differently, our technologists determine whether to use SmartCurve on a case-by-case basis.

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Endnotes

[1] Hologic, Inc. Three New Peer-reviewed Publications Further Validate the Benefits of Hologic 3D Mammography (Tomosynthesis) in Breast Cancer Screening. PR Newswire. com. https://www.prnewswire.com/news-releases/three-new-peer-reviewed-publications-further-validate-the-benefits-of-hologic-3d-mammography-tomosynthesis-in-breast-cancer-screening-244699671.html. Published February 10, 2014. February 2, 2024.

[2] Hande PC, Desai SS, Arneja SK, Sathian S. Utility of Digital Breast Tomosynthesis with Two-Dimensional Synthesized Mammography Images: A Pictorial Essay. Indian J Radiol Imaging. 2021 Aug 23;31(3):678-688. https://dx.doi.org/10.1055/s-0041-1734378.

[3] Rafferty EA, Durand MA, Conant EF, et al. Breast Cancer Screening Using Tomosynthesis and Digital Mammography in Dense and Nondense Breasts. JAMA. 2016;315(16):1784-1786. http://dx.doi.org/10.1001/jama.2016.1708.

[4] Yaghjyan L, Colditz GA, Collins LC, et al. Mammographic Breast Density and Subsequent Risk of Breast Cancer in Postmenopausal Women According to Tumor Characteristics. J Natl Cancer Inst. 2011;103(15):1179–1189.

[5] Conant EF, Talley MM, Parghi CR, et al. Mammographic Screening in Routine Practice: Multisite Study of Digital Breast Tomosynthesis and Digital Mammography Screenings. Radiology. 2023;307(3). https://dx.doi.org/doi.org/10.1148/radiol.221571.

[6] Akansel N, Gülşen M, Gültaş M. Influence of Discomfort Tolerance of Women who Undergo Mammography on the Perceived Pain Intensity Due to the Procedure. Eur J Breast Health. 2020;17(1):68-75. https://dx.doi.org/doi:10.4274/ejbh.2020.6068.

[7] Hologic, Inc. SmartCurve® Breast Stabilization System. Hologic.com. https://www.hologic.com/hologic-products/breast-health-solutions/smartcurve-breast-stabilization-system-230548828-1548098823.