

Screening with tomosynthesis and mammography is cost-effective

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Adding tomosynthesis to biennial digital mammography screening for women with dense breasts is likely to improve breast cancer detection at a reasonable cost relative to biennial mammography screening alone, according to a new study published online in the journal *Radiology*.

Mammography remains the only [screening](#) test proven to decrease mortality from breast cancer. However, mammography is less accurate in [women](#) with [dense breasts](#) for whom cancers may be masked by overlapping [breast tissue](#).

Moreover, dense breasts compared to average density breasts are associated with a moderate to high relative risk for developing breast cancer independent of the masking effect. Given that nearly half of the U.S. screening population has dense breasts, an increasingly large number of women may be encouraged to consider supplemental screening beyond conventional mammography.

"Screening MRI is the most sensitive breast imaging test, but is also more expensive, requires intravenous contrast injection and is currently reserved for screening women at high risk for breast cancer," said Christoph I. Lee, M.D., assistant professor in the Departments of Radiology Health Services at the University of Washington. "Digital breast tomosynthesis, in contrast to MRI, may offer operational and ease-of-use advantages since it is an integrated part of newer generation mammography units."

Digital breast tomosynthesis has shown promise at improving [breast cancer detection](#) in women with dense breast tissue. Tomosynthesis is similar to mammography in that it relies on ionizing radiation to generate images of the breast. However, unlike conventional mammography, tomosynthesis allows for three-dimensional (3-D) reconstruction of the breast tissue, which can then be viewed as sequential slices through the breast.

For this study, Dr. Lee and colleagues evaluated the comparative effectiveness of combined biennial digital mammography and tomosynthesis screening, compared to biennial digital [mammography screening](#) alone, among women with dense breasts.

The researchers used a [breast cancer](#) simulation model to estimate the comparative clinical effectiveness and cost-effectiveness of biennial screening with both digital mammography and tomosynthesis versus digital mammography alone among U.S. women ages 50 to 74 years with dense breasts, using data and metrics from the National Cancer Institute's Breast Cancer Surveillance Consortium, Medicare reimbursement rates and medical literature.

"Our analysis, using currently available data, provides women, physicians, payers and policymakers in the U.S. with much needed information regarding the comparative effectiveness of combined mammography and tomosynthesis screening relative to mammography screening alone," Dr. Lee said.

Their analysis showed that the incremental cost per quality-adjusted life year (QALY) gained by adding tomosynthesis to [digital mammography](#) screening was \$53,893. An additional 0.5 deaths were averted and 405 false-positives were avoided per 1,000 women after 12 rounds of screening. Combined screening remained cost-effective (less than \$100,000 per QALY gained).

"The decrease in false-positive results after adding tomosynthesis is a major contributor to the cost-effectiveness of combined screening," Dr. Lee said. "Our study suggests that adding tomosynthesis at the time of [mammography](#) screening has the potential to decrease the number of unnecessary diagnostic work-ups and invasive procedures that result from false-positive findings."

More information: "Comparative Effectiveness of Combined Digital Mammography and Tomosynthesis Screening for Women with Dense Breasts." *Radiology*, 2014.

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