The LOVE New Mexico study
Breast cancer screening among medically underserved women in New Mexico: Comparing outcomes and LOWERing recall rates with digital breast tomosynthesis (3-D) VERSus full-field digital (2-D) mammography

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Background & Objectives:
Screening digital breast tomosynthesis (3D mammography) decreases recall rates and improves cancer detection rates1.
Recall, requiring a second visit to an imaging facility, poses a unique challenge to medically underserved, rural women. Studies show that health literacy, insurance coverage, household income, and less than a high school education in women of Mexican origin consistently impacts screening rates2.

• We hypothesize that the use of 3-D mammography decreases the screening recall rate in New Mexico women, a region with a disproportionately high rate of poverty, widespread language barriers, and a large rural population.
• Primary Objective: To compare recall rates using 3-D versus 2-D mammogram in New Mexico women undergoing screening mammogram at the University of New Mexico (UNM) between 2013 and 2016. Recall rate defined as: # recalled / # screened.

• Secondary objective: To compare cancer detection rates and biopsy positive predictive values using 3-D versus 2-D mammogram in New Mexico women undergoing screening mammogram at the University of New Mexico (UNM) between 2013 and 2016. The cancer detection rate is defined as # cancer cases / # screened; the positive predictive value is defined as # cancer cases / # recalled.

Methods:
We conducted a retrospective study identifying 35,147 screening standard 2D and 3D screening mammograms performed between 2013-2016 in the UNM Department of Radiology using data abstracted through the PENRAD database. Recall rates, biopsy positive predictive values (PPV), and cancer detection rates were compared.

• The statistical variation related to a rate is computed using Binomial distribution. A relative risk compared between 3D vs. 2D over the year is calculated by applying the Cochran-Mantel-Haenszel approach.

Recall Rate Comparison:
• When compared to 2D, 3D mammography resulted in a statistically lower recall rate, at 8.4% vs 11.1% (p < 0.0001).

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• Primary Objective: To compare recall rates using 3-D versus 2-D mammogram in New Mexico women undergoing screening mammogram at the University of New Mexico (UNM) between 2013 and 2016. Recall rate defined as: # recalled / # screened.

• Secondary objective: To compare cancer detection rates and biopsy positive predictive values using 3-D versus 2-D mammogram in New Mexico women undergoing screening mammogram at the University of New Mexico (UNM) between 2013 and 2016. The cancer detection rate is defined as # cancer cases / # screened; the positive predictive value is defined as # cancer cases / # recalled.

Results:
Recall Rate Comparison:
• There was no difference in the cancer detection rate (5.3 vs. 5.1 per 1000 women) with 2D and 3D mammography. (Fig 3)

• There was no significant difference in PPV between mammography modes, though there was a trend towards a higher chance of PPV with 3D mammogram compared to the benchmark value of 4.4% over the study period, at 4.8% with 3D vs 6.0% with 2D mammogram (RR: 1.46, 95% CI: 0.97 - 2.19, p=0.07). (Fig 2)

Conclusions:
• In New Mexico women undergoing screening mammogram between 2013 and 2016, a significant 30% relative risk reduction in the recall rate was observed with the use of 3-D mammography compared to conventional 2-D imaging. This difference was most pronounced in the last year of the study.
• Our study did not show an increase in cancer detection rate, contrary to published European trials.
• These findings are pertinent to centers that similarly serve large numbers of women from minority, rural, financially constrained, and medically-underserved patient populations.
• The value of 3-D mammography as a screening method for breast cancer is currently under evaluation in multiple large population-based studies. However, the results of this study provide novel and previously unpublished insights regarding the unique value of incorporating 3-D mammography into cancer care delivery for medically underserved women. As a companion to the above, a prospective interview-based study evaluating beliefs and perceptions regarding 3D mammography enrolling both patients and providers is underway at our center.

References:

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