# Comparison of two-dimensional synthesized mammograms versus original digital mammograms alone and in combination with tomosynthesis images

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## Objective

To compare the diagnostic performance and radiation dose of Hologic's 2D synthesized mammogram when used alone or in combination with tomosynthesis to standard FFDM when used alone or in combination with tomosynthesis.

## Materials and Methods

Eight academic women's imagers retrospectively performed a reader study on 123 cases (36 biopsy verified cancers, 35 biopsy proven benign lesions and 52 recalled screening exams proven to be normal on recall and 1 year follow up). In this multi-case multi-reader study, each case was reviewed in two sequential reading modes; (a) synthesized mammogram followed by synthesized mammogram plus tomosynthesis and (b) FFDM followed by FFDM plus tomosynthesis. Probability of malignancy (POM) on a 100 point scale and BI-RADS scores were recorded for the 2D study and then again with tomosynthesis for each mode. Recall rates were also evaluated for each mode for both the proven cancer cases and benign cases.

## Results

The average AUC for all readers for synthesized mammogram and FFDM alone were 0.894 and 0.889 respectively and that of synthesized mammogram plus tomosynthesis and FFDM plus tomosynthesis were 0.916 and 0.939 respectively. The data demonstrated that there was no significant difference in the recall rates between synthesized mammogram and FFDM alone or between synthesized mammogram plus tomosynthesis and FFDM plus tomosynthesis for both the proven cancer cases and benign cases.

## Conclusion

The authors conclude that the use of Hologic's synthesized mammogram whether alone or in combination with tomosynthesis has similar diagnostic accuracy and may eliminate the need for FFDM in a routine clinical study. The authors also conclude that the use of synthesized mammogram reduces the radiation dose in patients that are undergoing tomosynthesis-based screening mammography.