Use of a Mammography Breast Cushion and Technologist Training Increases Tissue Acquisition, Enables Greater Compression, and Reduces Discomfort for Patients

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Objective/Background

Scientific literature confirms reduced compliance with age-appropriate screening in women age 40 and older who have previously experienced discomfort during mammography.[1] In studies with more than 1,300 women, a radiolucent breast cushion has been shown to reduce discomfort by nearly half for 70 percent of patients.[2,3] Combined with breast positioning training for technologists, this mammography aid has been shown to significantly increase tissue acquisition in all 4 standard views.[4,5]

We sought to test previous findings, and to determine if the aid/training combination could provide another clinical benefit—greater breast compression. Improved positioning and greater compression are known to improve image quality.[6,7]

Approximately 44% of study subjects were African-American women, making this the first study of the aid/training combination with a sizable cohort of African-American women. Among relevant issues affecting this group: 1) known sensitivity to mammography-related pain,[8] 2) lower rates of breast cancer screening,[9] and 3) higher breast cancer mortality rates.[9]

Table 1

Compression Force with Breast Cushion (Pounds)				
View	Current Year (with MammoPad®)	Prior Year (without MammoPad®)	Mean Difference	P-value
RCC	38.79	31.89	6.90	0.000
LCC	37.11	31.81	5.30	0.000
RMLO	40.10	34.39	5.71	0.000
LMLO	38.90	33.70	5.20	0.000

Table 2

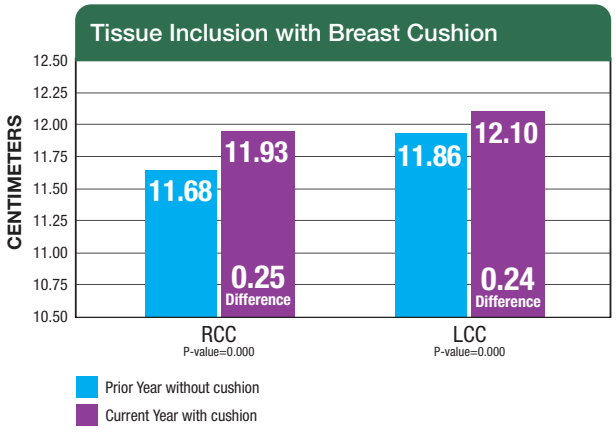
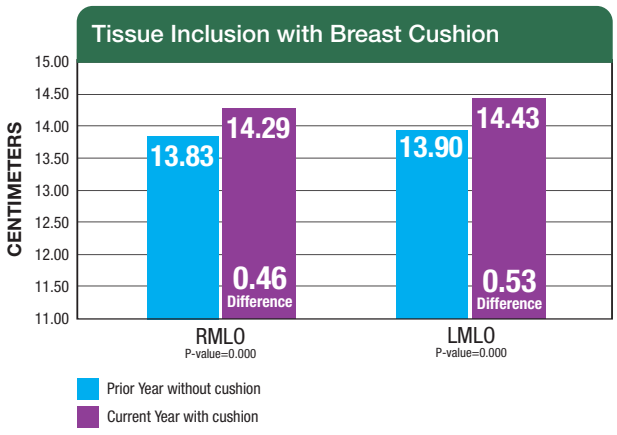


Table 3

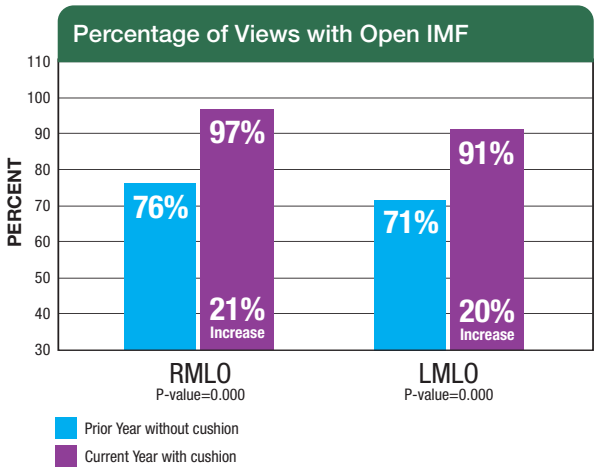


Methods

87 asymptomatic women presenting for screening mammography at Mercy Medical Center were enrolled in this study. Five technologists with experience ranging from 1 to 26 years were trained in breast positioning techniques using the breast cushion. After obtaining patient consent, each patient received a standard 4-view screening mammogram with the breast cushion. The current mammogram was compared to each subject's

mammogram from the prior year. Those mammograms had been conducted without the breast cushion and served as the control group. The posterior nipple line (PNL) was measured on all films and compression force recorded. The acceptability of each image was evaluated by the radiologist based on ACR-recommended positioning criteria. Patients completed questionnaires regarding exam comfort.

Table 4



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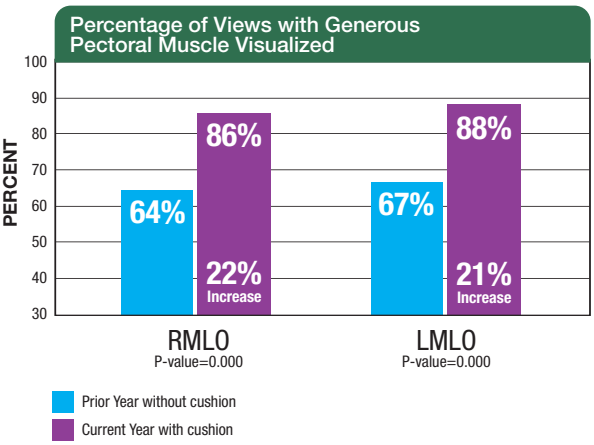


Results

The cushion and training resulted in significantly greater compression force for both Caucasian and African-American women, while also significantly increasing tissue acquisition for all 4 views and reducing discomfort (Table 1). The mean compression force was increased by 17.6%, while the mean discomfort score improved from 5.52 to 4.40. Tissue acquisition was increased by an average of 0.25cm on the CC views and 0.50cm on the MLO views (Tables 2-3). Openness of inframammary fold and visualization of pectoralis muscle also significantly increased compared to prior year's images by approximately 20% (Tables 4-5). There was no significant difference in results because of ethnicity or technologist participation.

Conclusion

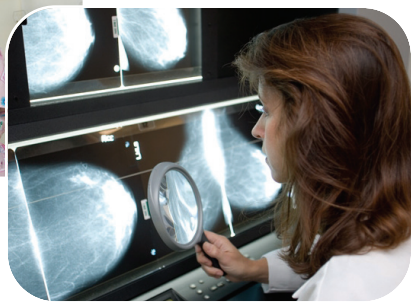
Significant improvement was documented in tissue acquisition, positioning characteristics, compression force, and patient comfort regardless of ethnicity. The resulting images generally showed an overall improvement.

The cushion-specific benefits are likely due to its grip-like surface that helps hold the breast in place and its ability to significantly reduce breast positioning-related discomfort.

The pairing of the breast cushion and training may be useful in detecting breast cancer, due to the increased compression and increased tissue acquisition achieved.

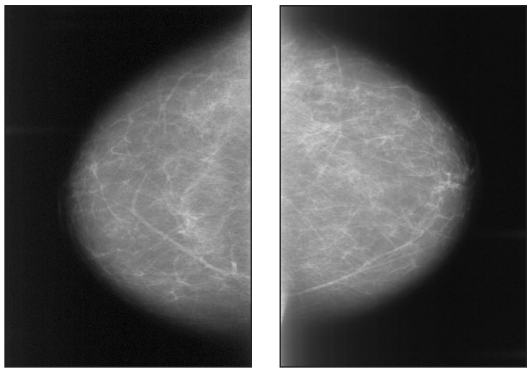
Greater exam comfort may be of special interest to African-American women given their known sensitivity to mammography-related pain.

Pam Waller applies the breast cushion

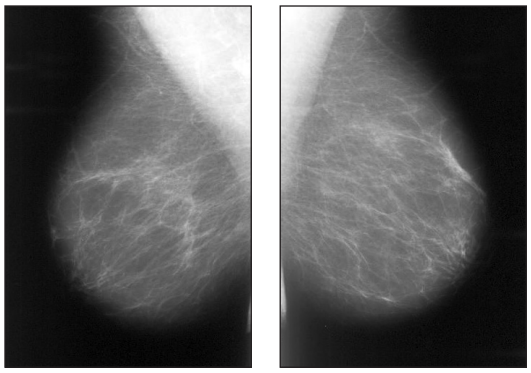


Dr. Barbara Jaeger reviewing films

Case 1
2005 Images without cushion

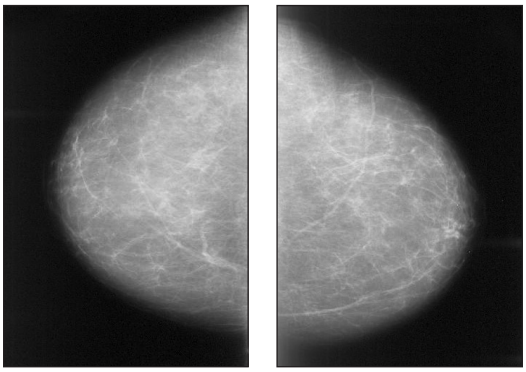


RCC LCC

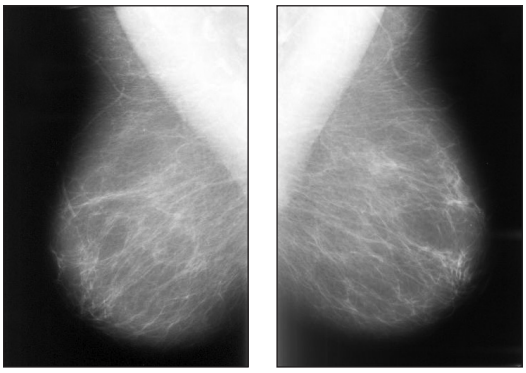


RMLO LMLO

Case 1
2006 Images with cushion

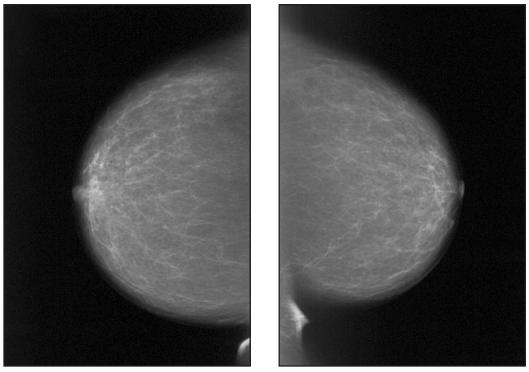


RCC LCC

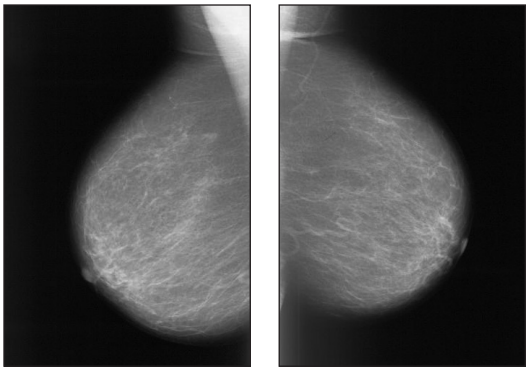


RMLO LMLO

Case 2
2005 Images without cushion

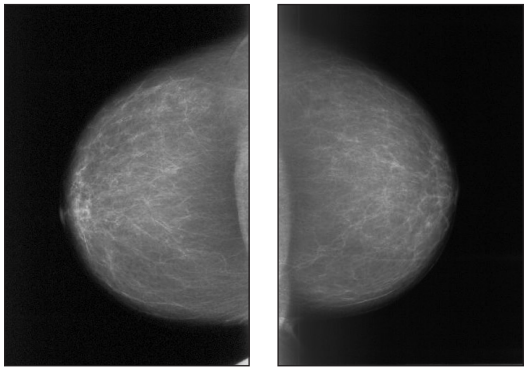


RCC LCC

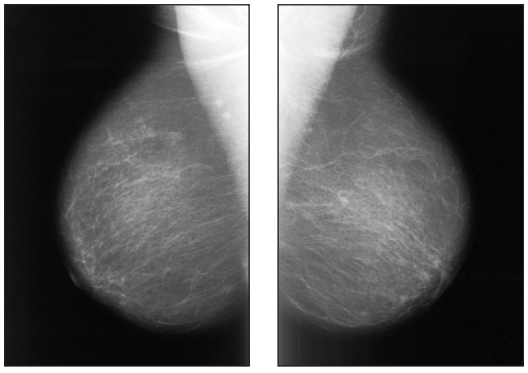


RMLO LMLO

Case 2
2006 Images with cushion



RCC LCC



RMLO LMLO

References on back page

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