RSNA 2023
LEADING THROUGH CHANGE

Objective improvements in mammography image quality following individualized breast positioning training informed by artificial intelligence

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Background

Breast positioning a key aspect of mammography image quality (IQ)

Bassett et al., 1993;
Taplin et al., 2002; Bae et al., 2014

Current breast positioning assessment manual and subjective

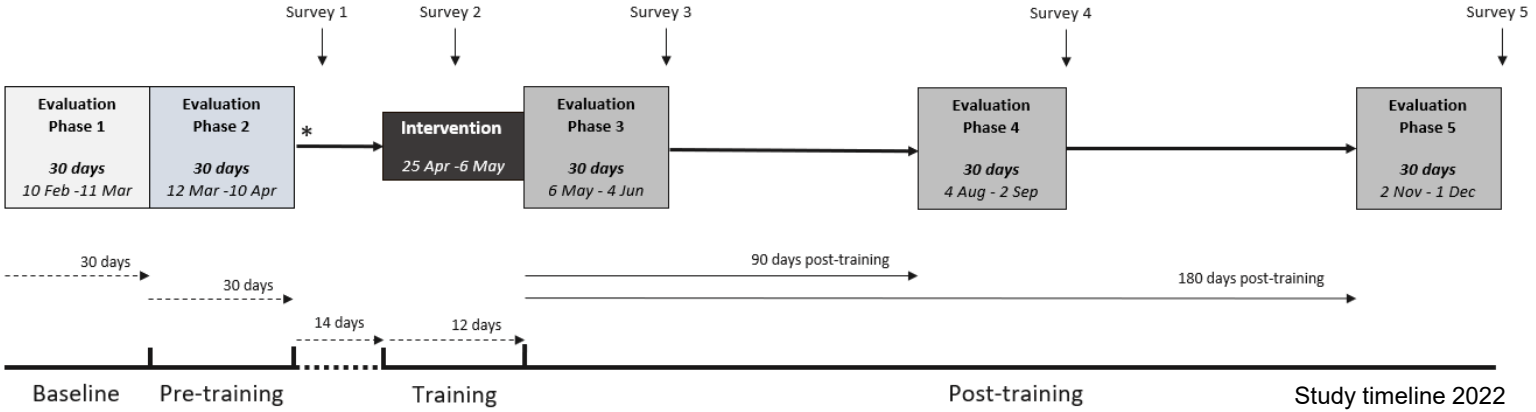
Targeted initiatives improve image quality

Pal et al., 2018;
Santner et al., 2021; Kozlov et al., 2023

Purpose: to evaluate the IQ impact of expert hands-on breast positioning training, individualized to technologists as informed by an artificial intelligence IQ assessment system

Methods

Study Timeline



- Volpara Analytics™ in use >2 years at Control & Intervention Sites prior to study
- No intervention at Control Site & no specific quality improvement objectives during study period
- Technologist (‘Tech’) inclusion criteria: acquired >90 images per eval. period

Methods

Training

- Training individualized by objective evidence from Volpara® Analytics™ metrics
- Hands-on positioning training by Mammography Educators® via The Miller Method™

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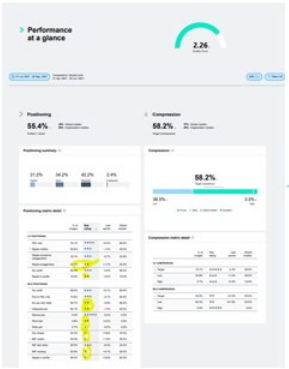

Performance report generated

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Areas of focus identified by AI

POSITIONING METRIC	REVIEWED
CC POSITIONING	
Nipple midline Nipple exaggerated	
Nipple in profile	
MLO POSITIONING	
No pec skin folds	
Adequate pec Short pec Wide pec	
Pec shape	
IMF visible IMF missing	
Nipple in profile	

Targeted Training Profile prepared for individualized training

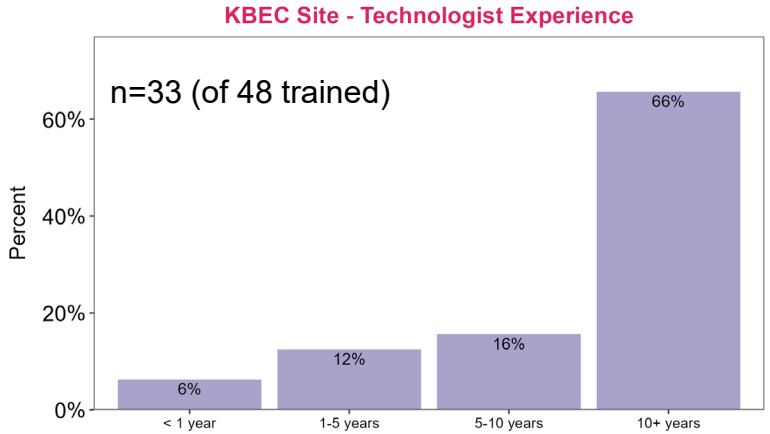
Results

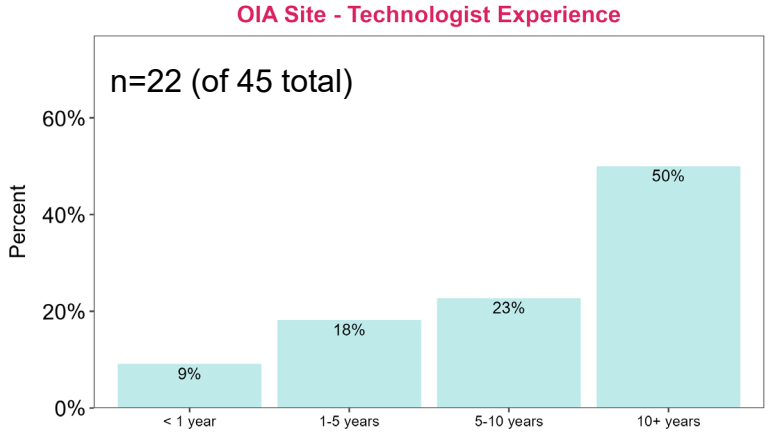
Techs & training

Number Techs trained per positioning metric:

Metrics	Total Techs Trained out of 33	Percent Trained
CC Nipple in Profile	29	91%
MLO Nipple In Profile	29	91%
MLO IMF Visible - IMF Skin Folds	28	88%
MLO No Pec Skin Folds	28	88%
MLO Pec Shape	26	81%
CC No Cutoff	21	66%
CC Nipple Midline - Nipple Exaggerated	21	66%
MLO No Cutoff	19	59%
MLO IMF Visible	18	56%
MLO Adequate Pec - Narrow Pec	16	50%
CC Nipple Midline	15	47%
CC Nipple Midline - Nipple Excessive Exaggerated	13	41%
MLO Adequate Pec	11	34%
MLO Adequate Pec - Short Pec	11	34%
MLO Adequate Pec - Wide Pec	11	34%
CC PNL Met	6	19%
MLO Pec To PNL Met	5	16%
MLO IMF Visible - IMF Missing	4	13%

*n=33 *included in study* of 48 total trained

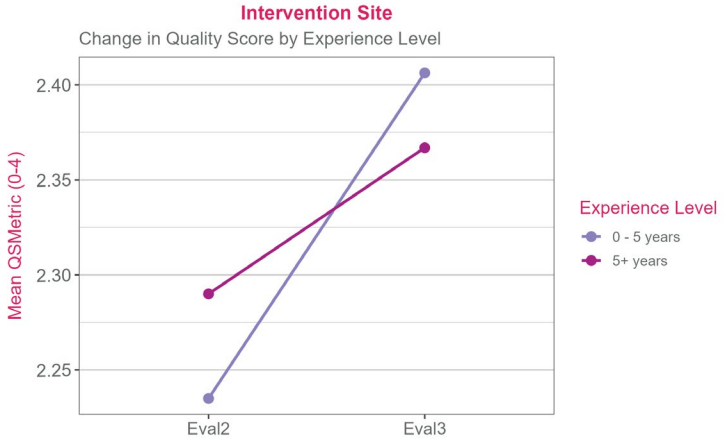


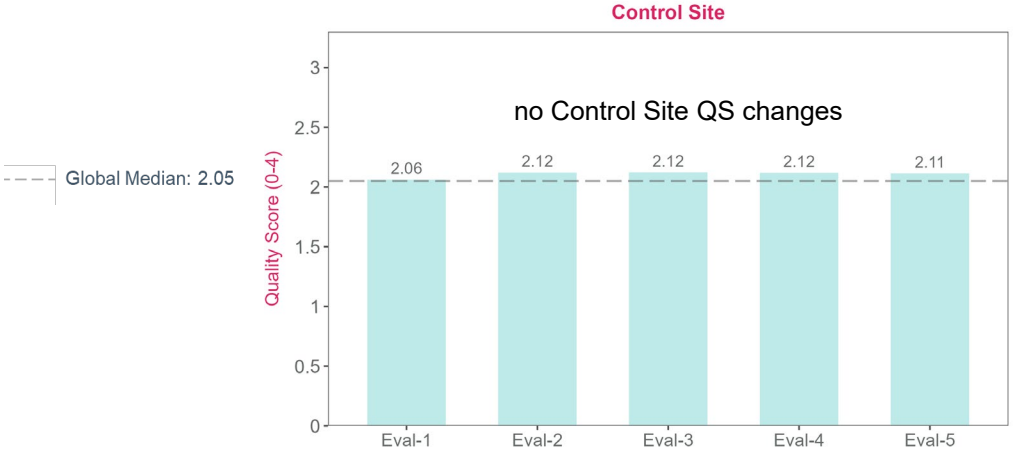


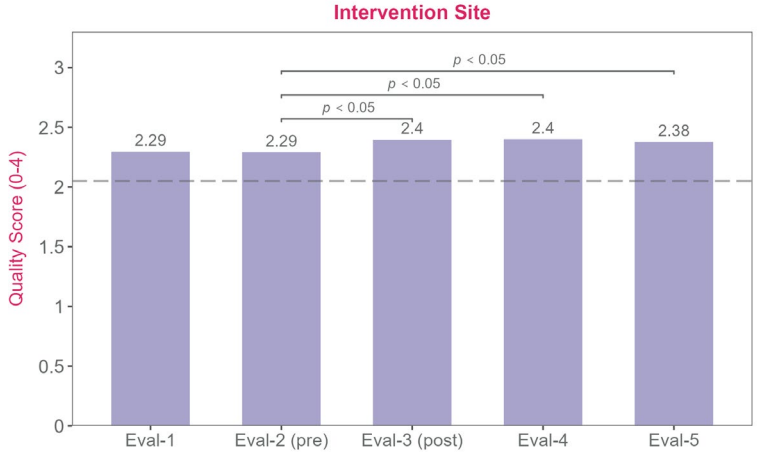
Results

Quality Score (QS)

- +4% QS improvement at Intervention Site (p<0.05)
  - sustained for 6 months
  - Techs of all experience levels improved





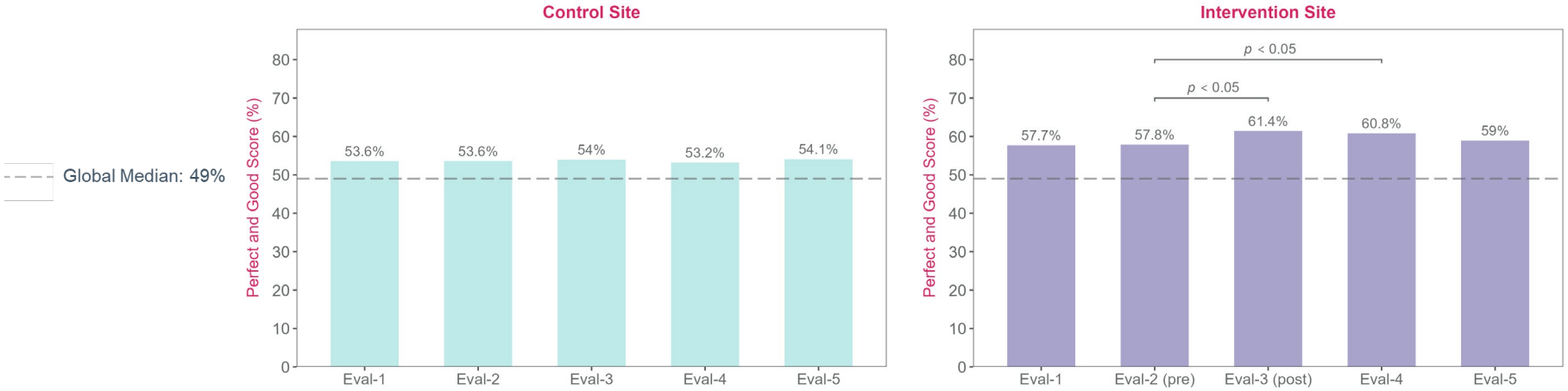


Global Median value from Volpara Analytics™

Results

PGMI

- Early Intervention Site quality improvements driven by increased %P+G (p<0.05)
  - 57.8%—61.4% 30 days post-training & 60.8% 90 days post-training

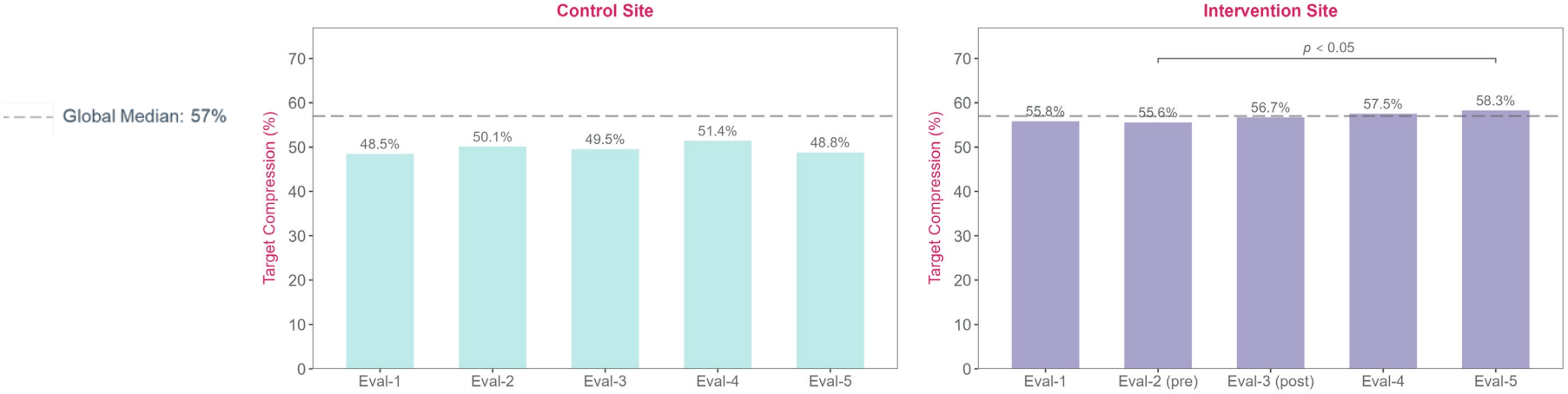


Global Median value from Volpara Analytics™

Results

Compression

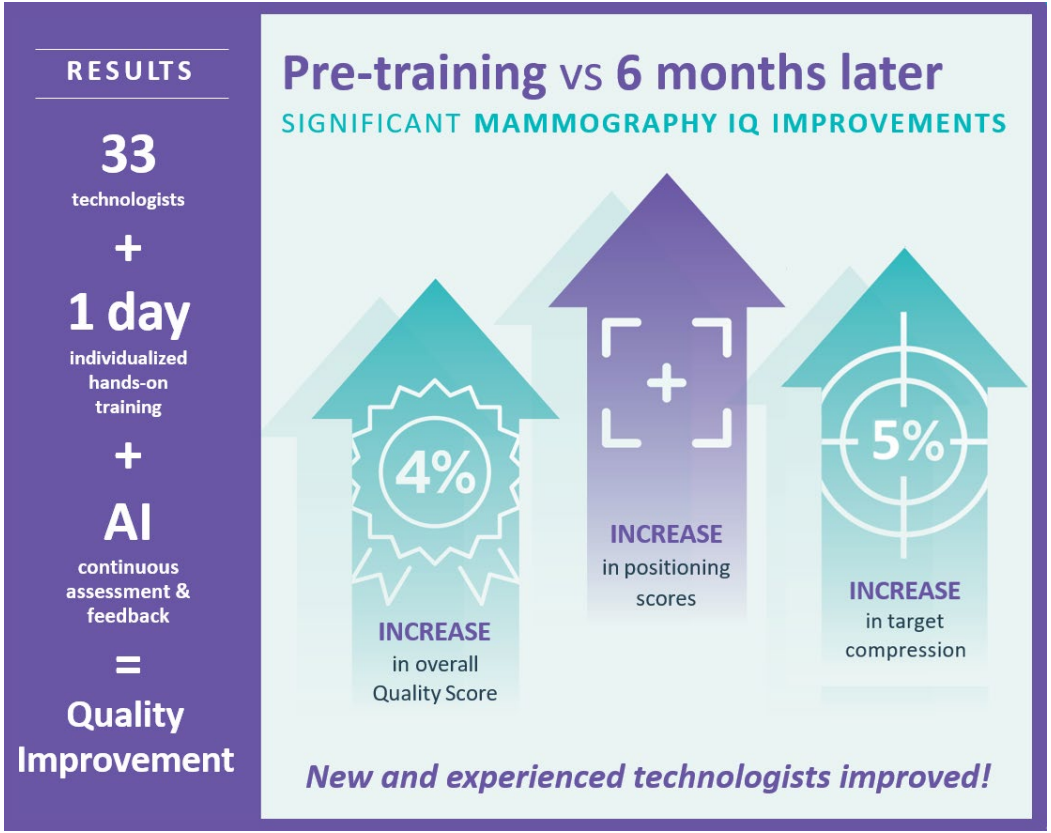
- Increased % target compression in last eval. period ($p<0.05$)
  - 55.6%—58.3%, 180 days post-training



Global Median value from Volpara Analytics™

Summary

- AI-informed individualized and hands-on Tech training resulted in significant and sustained mammography IQ improvements across experience levels
- Quality improvement drivers changed over time, suggesting ongoing monitoring is important to identify new areas of focus and training opportunities



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THANK YOU

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