

Welcome to  
Mammography Educators  
**SPRING**  
2023 Breast Imaging Symposium!!  
*Thank you so much for joining us!!*



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THANK YOU!!

**FUJIFILM**  
Value from Innovation



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**Positioning Techniques:  
How Far Have We Come**

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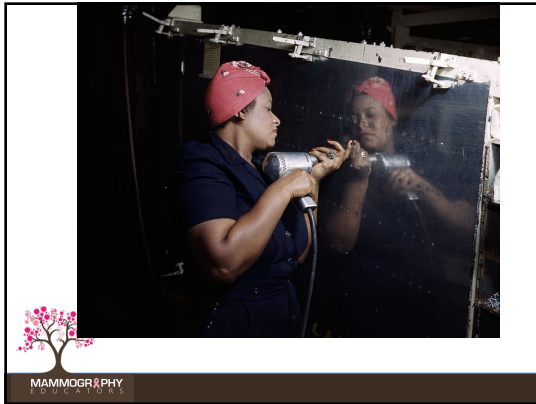


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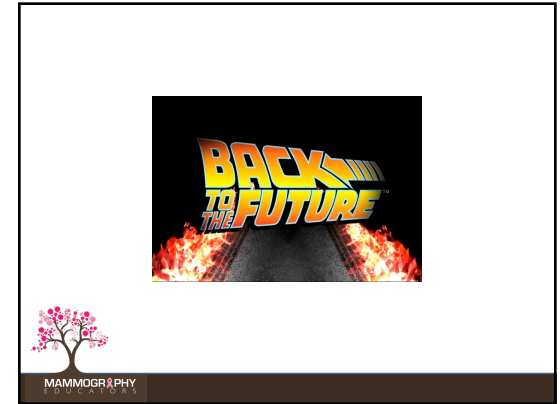
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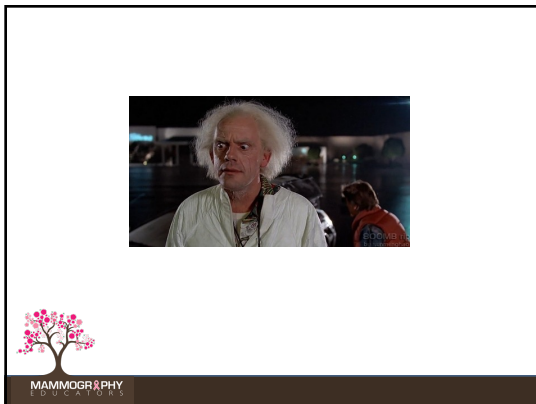
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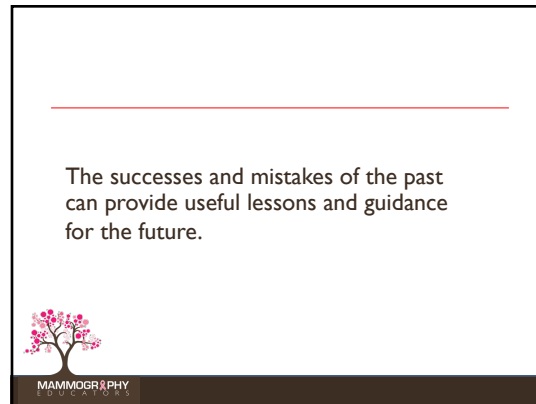
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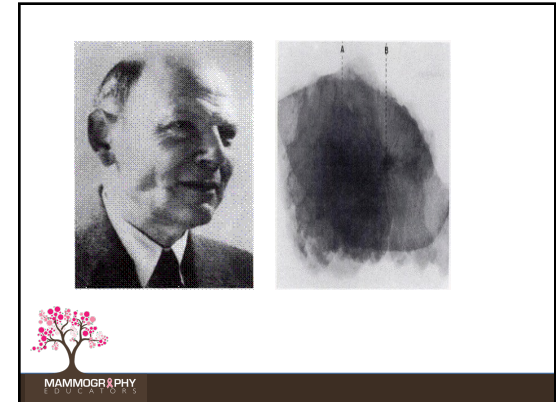
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**1949** - Uruguayan Raul Leborgne emphasizes the need for breast compression to identify calcifications.  
**1966** – The first dedicated mammography system is introduced.  
**1971** – Commercial introduction of xeromammography  
**1980** – Introduction of single emulsion film

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- Egan technique
- Xeroradiography
- Dedicated mammography units
- Film/screen systems (grids)
- Rigid compression
- Is there a benefit from screening?
- Needle localization
- Ultrasound
- Tomography
- MRI

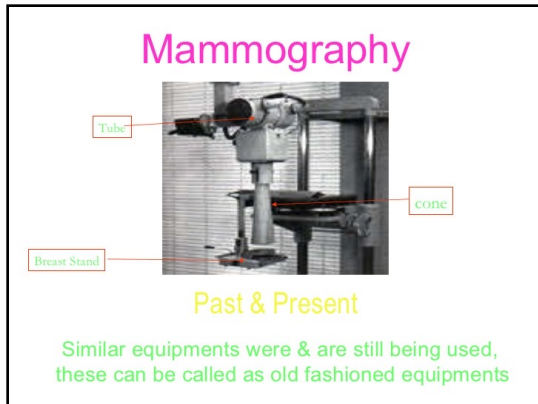
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Mammography technology has come a long way since the first machine specifically designed for producing mammograms was introduced in 1966.

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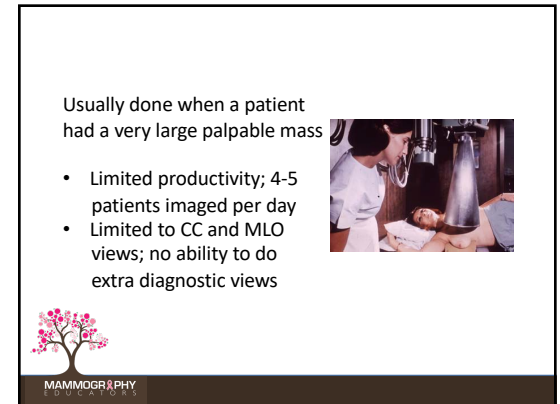
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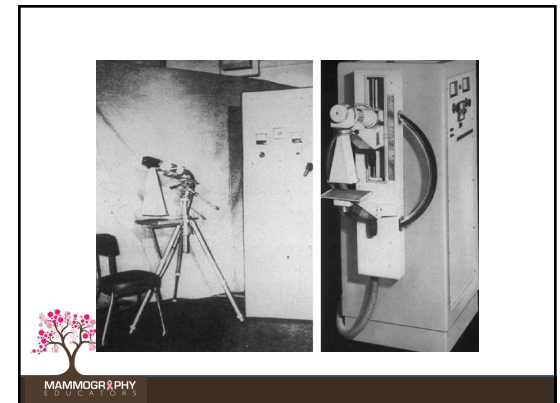
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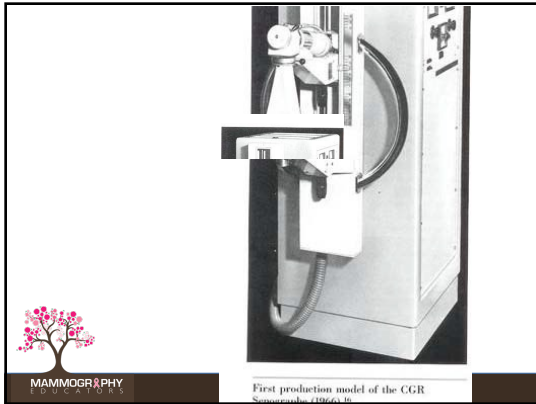
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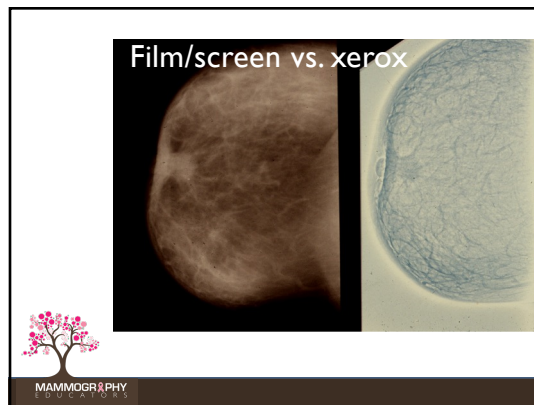
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### Xerography

- Introduced in 1971
- Provided better image quality than systems using industrial film packs
- Allowed excellent visualization of chest wall
- The Granddaddy of selenium digital technology
- Key Inventor – Lothar Jeromin (“Mr. Xerox”)
- Holds 23 patents

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### Positioning Training for Technologists

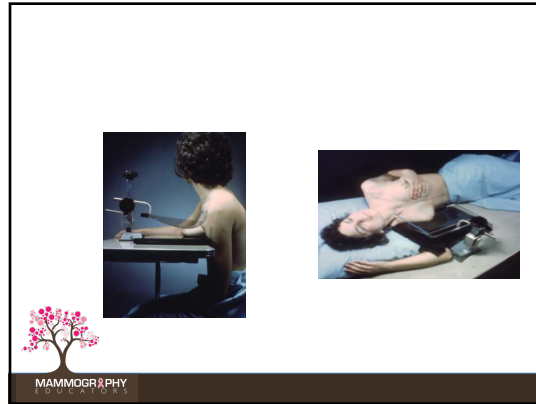
- See one, do one, teach one
- Watch one, botch one

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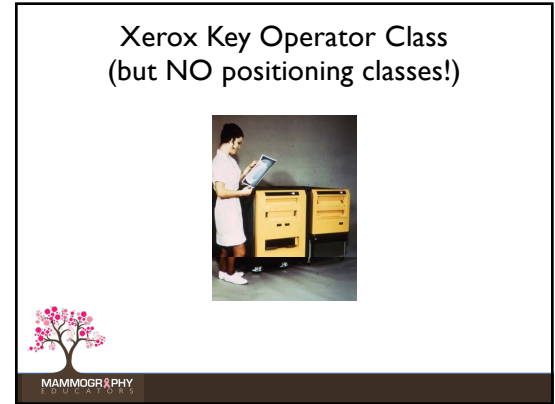
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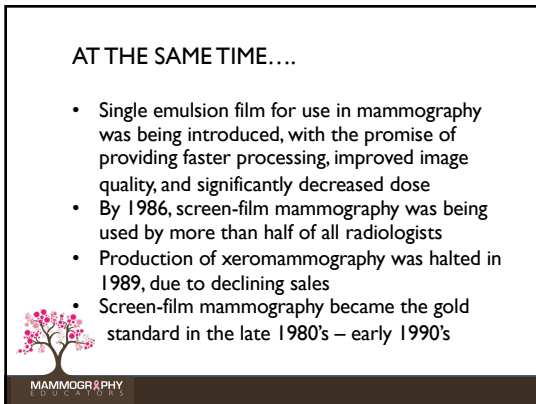
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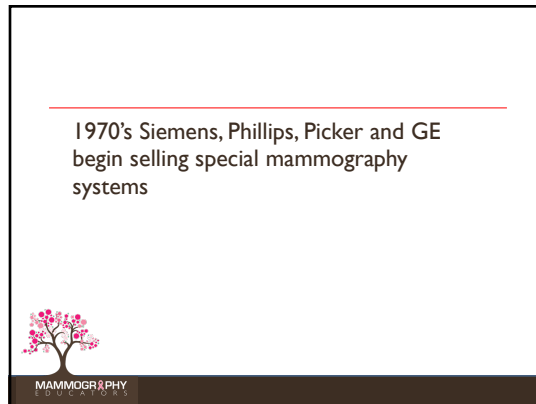
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1986-ACS and ACR develop a breast screening accreditation program for radiologists and *technologists*



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### ACS/ACR Consensus Meeting - 1989

- Developed a “curriculum” for technologists
- Produced (with ASRT) the first “Positioning Guidebook” which showed “how” to position for the CC and MLO
- Included instruction on additional views
- Out of publication by 2000



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1992- Federal Mammography Quality Standards Act passed **MQSA** in the US



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### MQSA Requirements

- 40 hours of education related to specific topics in Mammography which included positioning
- Requirement for 25 hands-on “under supervision”
- 15 CEUs in mammography every 5 years
- No requirements for hands-on!



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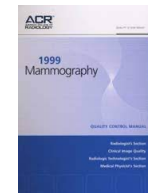
### ACR QA Manuals 1993 - 1999

- Included sections on positioning
- All images were taken on film screen units
- Has not been updated since then
- Includes no recommendations for FFDM or DBT formats



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1980's-90's

Major improvements in mammography equipment include reduced radiation dosage; automatic exposure controls;



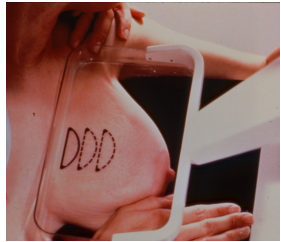

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Better film; film emulsifiers and processing; digital imaging, and computerized diagnosis.....but better positioning techniques?



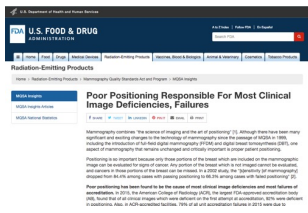

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Rigid Compression – Taut – Up and Out

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Importance of Proper Positioning





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Decreased Sensitivity

- 84.4% with proper position
- 66.3% with failed positioning


= 18.1% decreased



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We Need to Correct

- **Lack of updated standardized training**
- Little or no consistency and reproducibility in positioning sequence
- Little or no consistency and reproducibility in positioning technique
- Lack of use of proper body ergonomics




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## Standardized Positioning Techniques

- Data shows a distinct improvement with the use of updated positioning techniques designed for use with FFDM and DBT
- Sets reasonable expectations




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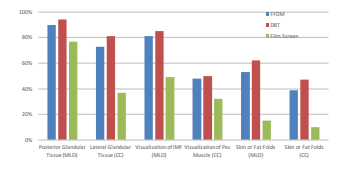
American Journal of Roentgenology, April, Vol. 210, No. 4 : pp. 807-815  
 Improving Performance of Mammographic Breast Positioning in an Academic Radiology Practice  
 Sunita Pal, Debra M. Ireda, Robert A. Jessinger, L. Jake Mickelsen ... Show all  
<https://doi.org/10.2214/AJR.17.18212>

American Journal of Roentgenology, December, Vol. 209, No. 6 : pp. 1419-1425  
 Mammography Positioning Standards in the Digital Era: Is the Status Quo Acceptable?  
 Ashley L. Huppe, Kelly L. Overman, Jason B. Galewood, Jacqueline D. Hill, Louise C. Miller, and Marc F. Inciaro  
<https://doi.org/10.2214/AJR.16.17522>




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### Criteria met after Updated Standardized Positioning Training\*




\*AJR, December 2017



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### Reasonable Expectations


	FFDM	DBT	3.0mm
<b>MLO view</b>			
Visualization of Pecs Muscle on PML	88%	87%	82%
Clavicle PCL	90%	88%	-
Scapula PCL	81%	80%	-
Clavicle PCL	23%	24%	-
Wide Margins at Top of PCL	90%	88%	-
No Motion	98%	97%	99%
Asymmetrical Tissue Included	90%	88%	77%
nipple in Profile	89%	82%	88%
Skid or Not Visible	83%	82%	15%
Upper Location	20%	27%	-
Lower Location	20%	21%	-
Visualization of Infraclavicular Fold	81%	80%	88%
Requires More Than One View	13%	17%	-
<b>CC view</b>			
Pec Muscle Visualized	88%	88%	83%
the Mottled	100%	98%	-
Lateral Clavicular Tissue Included	73%	81%	87%
nipple in Profile	81%	80%	88%
Skid or Not Visible	98%	87%	10%
Asymmetrical	100%	100%	-
Lateral Location	29%	32%	-
Visualization of Clavicle	84%	84%	-
Requires More Than One View	1%	7%	-



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## We Need to Correct

- Lack of updated standardized training
- Little or no consistency and reproducibility in positioning sequence**
- Little or no consistency and reproducibility in positioning technique
- Lack of use of proper body ergonomics



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Most medical imaging exams are done using the *same* positioning technique, in the *same* sequence.



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But in mammography... we are “all over the map.”

- LCC, LMLO, RMLO, RCC
- RCC, LCC, RMLO, LMLO
- RMLO, RCC, LMLO, LCC
- LCC, RCC, LMLO, RMLO
- RCC, RMLO, LMLO, LCC
- LCC, LMLO, RCC, RMLO
- LMLO, LCC, RCC, RMLO




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My Suggestion:

- Do CC's first.
- Then do the MLO on the side you just finished the CC on.
- Finally, do the other MLO.

Example: RCC, LCC, LMLO, RMLO




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We Need to Correct

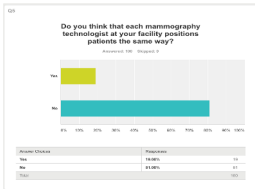
- Lack of updated standardized training
- Little or no consistency and reproducibility in positioning sequence
- **Little or no consistency and reproducibility in positioning technique**
- Lack of use of proper body ergonomics



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Most technologists *do not* practice a standardized method of positioning



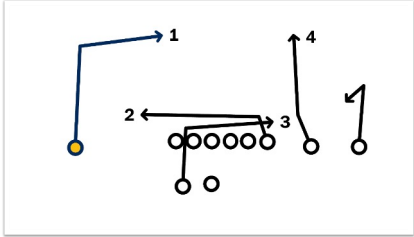

Do you think that each mammography technologist at your facility positions patients the same way?

Response	Count	Percentage
Yes	13	13.0%
No	87	87.0%
Total	100	100.0%



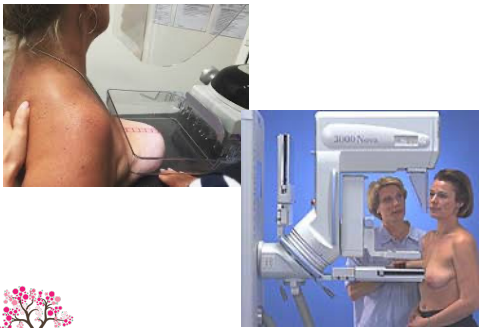

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**The Miller Method™**

**CC QUICK STEPS**

The following steps should be performed after the proper compression paddle has been chosen, machine is in charge position and the patient is lying on the machine with feet, top and shoulders raised and feet. Stand on the **right** side of the breast to be imaged. Steps below apply to patients for the CC.

1. Elevate breast (P) just the PA, is perpendicular to the chest wall
2. Align R height (on top edge is parallel with elevated P)
3. P/R breast onto R and turn back (R hand on top, right hand on bottom)
4. Anchor breast with the base of your thumb (after washing hands)
5. L/R other breast onto R (turn patient forward, if needed)
6. Guide the patient's head forward and around
7. Raise shoulder on side being imaged with your hand
8. P/R on lateral breast base and compress



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**The Miller Method™**

**MLO QUICK STEPS**

The following steps should be performed after choosing the proper degree of angulation, the proper compression paddle is chosen and placed on the breast and the patient is lying on the machine with both feet, top and shoulders raised and feet. Stand on the **right** side of the breast to be imaged. Determine angle and adjust machine height. Steps below apply to patients for the MLO.

1. Stand perpendicular to the patient
2. L/R patient's arm up over R
3. R/phant in back of back (just superior to latissimus dorsi)
4. Patient's hand resting on her elbow bent
5. Place your left hand on patient's left shoulder
6. Your right hand slides down lateral side of breast
7. MLO breast up and out and compress



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**CC**

**OVERHEAD VIEW**

**MLO**

**OVERHEAD VIEW**



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Stand Up Straight!



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My Mom Says So!



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And Stand on the **Medial** Slide of the Breast to be Imaged



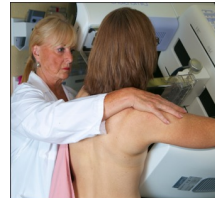
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In Mammography

- Most technologists have not been taught a standardized method of positioning.
- Most technologists have not been trained by a qualified trainer.



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### How did this happen?

- No current standardization for positioning for FFDM and DBT
- CEUs for hands-on positioning not required
- Initial 25 mammograms required, but under whose supervision?



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### How did this happen?

- Updated positioning trainings are not provided by employers.
- Until recently, there was no current published data to establish parameters for positioning criteria.



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### How did this happen?

- Technologists are getting most CEUs online (no actual education for positioning).
- Radiologists are passing inadequate images and/or can only give feedback regarding positioning criteria.



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### How did this happen?

- No updates for positioning with FFDM or DBT (and the new equipment design requires a modification of positioning techniques used for FS).



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### FS/FFDM/DBT

- Increased length of the IR by up to 40%
- Increased thickness of the IR by up to 80%
- Increased width of face shield up to 50%



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### So the problem is:

- No standardization or follow-through
- Which means less consistency and reproducibility
- More repeats and rejects
- More accreditation failures
- Increased exposure
- More job related injuries
- Increased costs to employers
- MISSED BREAST CANCERS???



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**STANDARDIZED  
POSITIONING TECHNIQUES  
ARE KEY!!**



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**WHY???**

- Consistency
- Reproducibility
- Efficiency
- Proficiency
- Use of proper body mechanics




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**Room for Improvement**

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Remember when evaluating new imaging techniques:

**Data is needed!!**




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**Room for Improvement**

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Remember when evaluating new positioning techniques:

**Data is needed!!**



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**Super Mammotechs of the World!**





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**Interact with Breast Imaging Professionals from Around the World**

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**Services we offer, include:**

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**Questions or Comments?**

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