

Positioning Pearls and Pitfalls

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1

Pearls



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Pearl Power



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Pitfalls



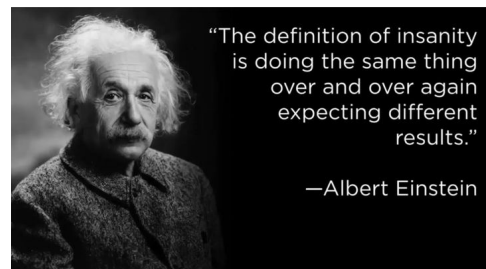
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5



“The definition of insanity
is doing the same thing
over and over again
expecting different
results.”

—Albert Einstein



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6

Pearls

- Use principles of general radiology positioning techniques
- Use standardized sequence
- Use standardized technique
- Use proper body mechanics



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7

Pearls

- **Use principles of general radiology positioning techniques**
- Use standardized sequence
- Use standardized technique
- Use proper body mechanics



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8

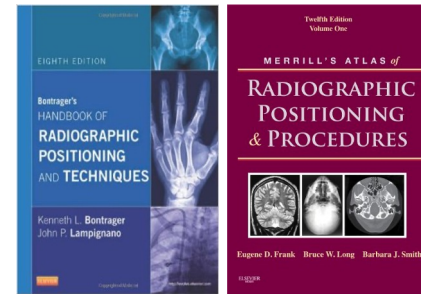
Standardized Technologist Training for General Radiology



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Bontrager's and Merrill's



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Standardization

- We all position the same way for every body part
- We all do it in the same sequence
- We all set up the machine before we bring the patient in
- We all position the whole patient, not just the body part



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In General Radiology

All training is competency-based and a technologist's skills will be evaluated for *positioning techniques*, as well as *clinical image evaluation*.



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12



13

Standardization


- **Machine**
- **Patient**
- **Body part (breast)**



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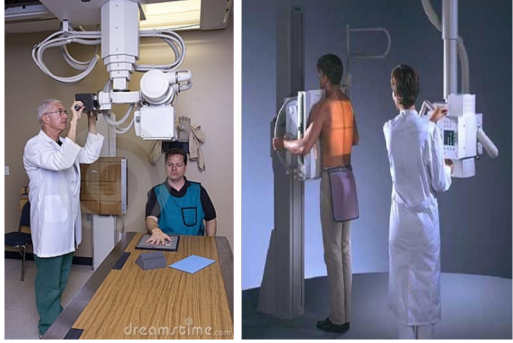
14

We position the **whole patient**,
not just the body part!



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Standardization in Mammography

- **M**achine: paddle size, height, angle
- **P**atient: facing forward with both feet, hips, and shoulders
- **B**reast: elevated to appropriate height/position maintained by compression



17

Standardization

- **M**aking
- **P**ositioning
- **B**etter



18

Pearls

- Use principles of general radiology positioning techniques
- **Use standardized sequence**
- Use standardized technique
- Use proper body mechanics



19

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



20

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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Pearls

- Use principles of general radiology positioning techniques
- Use standardized sequence
- **Use standardized technique**
- Use proper body mechanics



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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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AJR American Journal of Roentgenology

American Journal of Roentgenology, April, Vol. 210, No. 4 : pp. 807-815

Improving Performance of Mammographic Breast Positioning in an Academic Radiology Practice
 Sumita Pal, Debra M. Ikeda, Robert A. Jesinger, L. Jake Mickelsen ... Show all
<https://doi.org/10.2214/AJR.17.16212>

American Journal of Roentgenology, December, Vol. 209, No. 6 : pp. 1419-1425

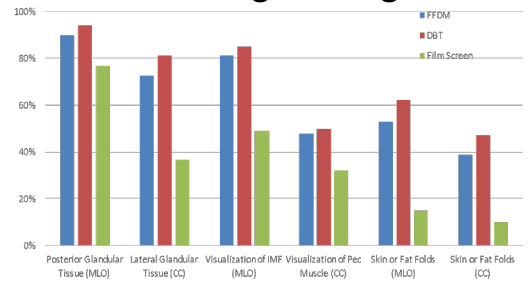
Mammography Positioning Standards in the Digital Era: Is the Status Quo Acceptable?
 Ashley I. Hippe, Kelly L. Overman, Jason B. Gatewood, Jacqueline D. Hill, Louise C. Miller, and Marc F. Inciardi
<https://doi.org/10.2214/AJR.16.17522>




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Criteria met after Updated Standardized Positioning Training*



| Criteria | FFDM (%) | DBT (%) | Film Screen (%) |
|----------------------------------|----------|---------|-----------------|
| Posterior Glandular Tissue (MLO) | ~90 | ~95 | ~75 |
| Lateral Glandular Tissue (CC) | ~70 | ~80 | ~35 |
| Visualization of IMF (MLO) | ~80 | ~85 | ~50 |
| Visualization of Pec Muscle (CC) | ~45 | ~50 | ~30 |
| Skin or Fat Folds (MLO) | ~50 | ~60 | ~15 |
| Skin or Fat Folds (CC) | ~35 | ~45 | ~10 |




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Source: American Journal of Roentgenology- 209, December 2017

26

Reasonable Expectations

| Positioning Criteria | FFDM | DBT | Bassett |
|-------------------------------------|------|-----|---------|
| Visualization of Pec Muscle to PNL | 86% | 87% | 81% |
| Concave Pec | 36% | 28% | - |
| Straight Pec | 42% | 48% | - |
| Convex Pec | 23% | 26% | - |
| Wide Margin at Top of Pec | 95% | 93% | - |
| No Motion | 98% | 97% | 99% |
| Posterior Glandular Tissue Included | 90% | 94% | 79% |
| Nipple in Profile | 89% | 92% | 88% |
| Skin or fat folds | 53% | 62% | 35% |
| Upper Location | 25% | 27% | - |
| Lower Location | 35% | 43% | - |
| Visualization of Inframammary Fold | 81% | 83% | - |
| Requires More Than One View | 13% | 17% | - |
| Pec Muscle Visualized | 48% | 52% | 32% |
| No Motion | 100% | 98% | - |
| Lateral Glandular Tissue Included | 73% | 81% | 37% |
| Nipple in Profile | 83% | 83% | 89% |
| Skin or fat folds | 39% | 47% | 30% |
| Medial Location | 38% | 27% | - |
| Lateral Location | 29% | 32% | - |
| Visualization of Cleavage | 41% | 34% | - |
| Requires More Than One View | 5% | 7% | - |

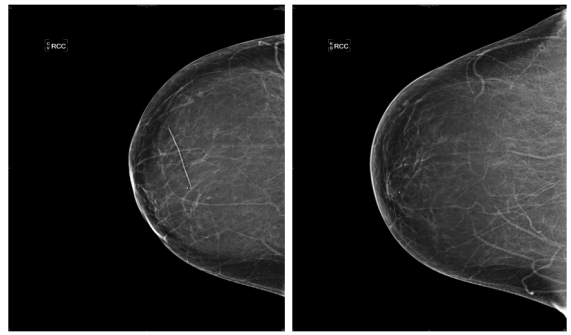



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Source: American Journal of Roentgenology- 209, December 2017

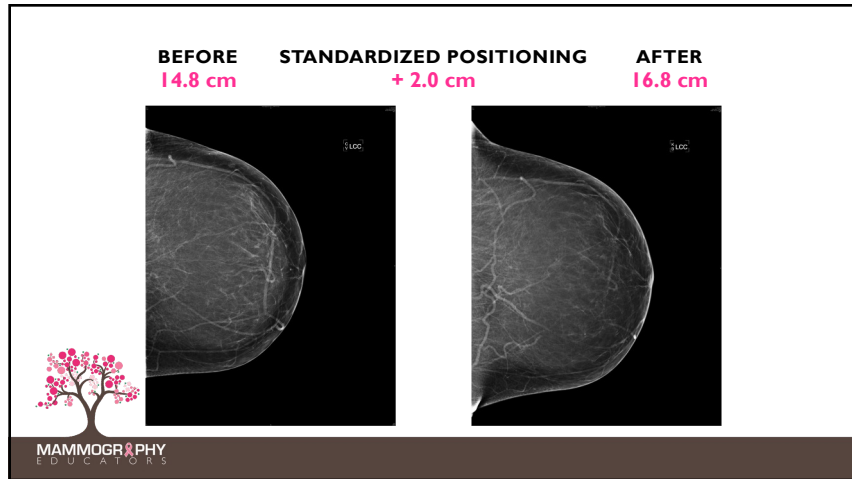
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BEFORE 13.1 cm **STANDARDIZED POSITIONING** + 3.0 cm **AFTER** 16.6 cm

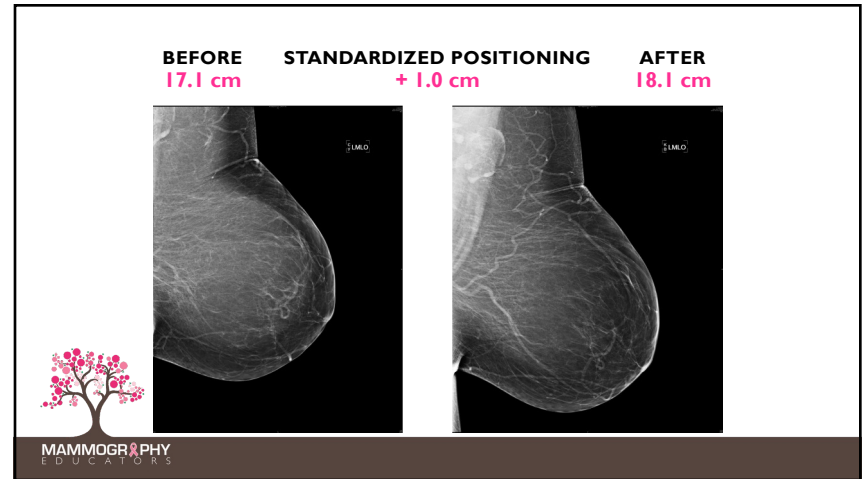



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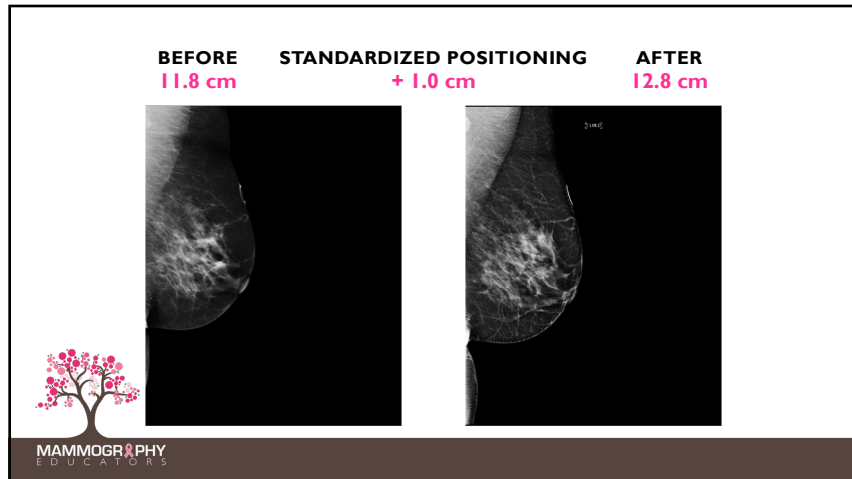
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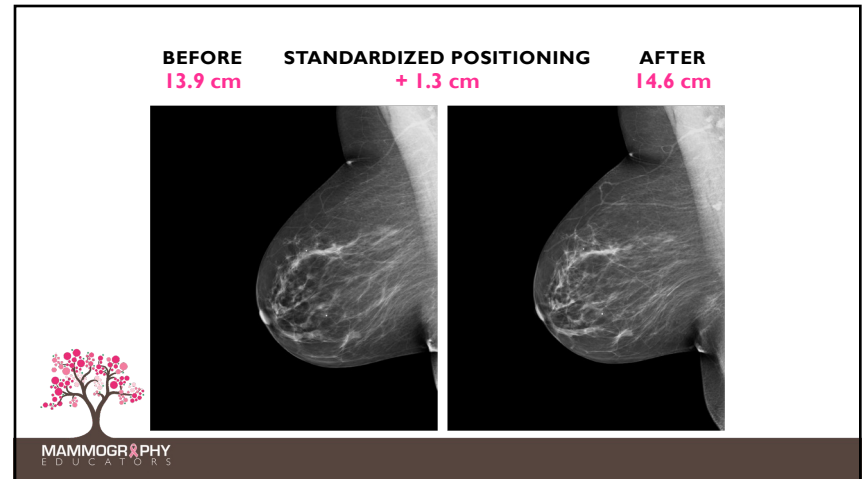
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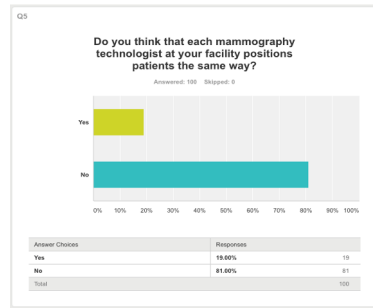


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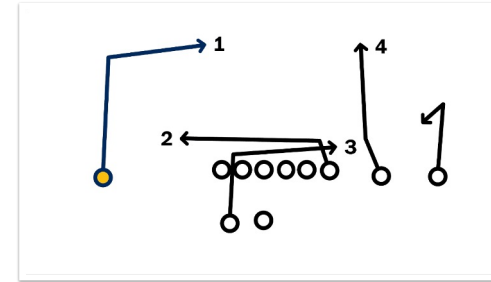
32

Most Technologists Do Not Practice a Standardized Method of Positioning



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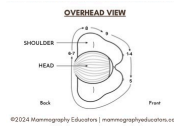


The Miller Method™ CC QUICK STEPS

The following steps should be performed after the proper compression paddles size is chosen, machine is at 0 degree angulation and the patient is facing the machine with feet, hips and shoulders forward and level. The patient should be standing back about 2" from the IR with her nipple centered to the IR (or as close as possible). Stand on the medial side of the breast to be imaged.

Steps below describe positioning for the **LCC**.

1. Elevate breast/IMF (until the PNL is perpendicular to the chest wall)
2. Adjust IR height (so top edge is parallel with elevated IMF)
3. Pull the breast onto the IR with both hands (left hand on top; right hand on bottom). At the same time, ask the patient to step forward into the machine (not to lean in) and have her turn her face towards you
4. Anchor the breast with the base of your right thumb (after switching hands)
5. Lift the opposite breast onto IR with your left index finger in the IMF against the ribcage and your left thumb on the top of the breast, then ask the patient to turn her right hip forward
6. Guide the patient's head forward and around the face shield, if possible
7. Place your left elbow and forearm at the mid thoracic region (where her bra clasp would be) and gently push the patient forward
8. Relax her left shoulder with your left hand (if possible)
9. Slide superior breast tissue forward by placing the base/edge of your right thumb on the top of the breast against the chest wall, then apply compression while continuing to "push" the patient forward



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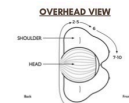


The Miller Method™ MLO QUICK STEPS

The following steps should be performed after choosing the proper compression paddle is chosen and shifted (as needed), the proper degree of angulation is chosen and the IR lowered (as needed). The patient is facing the machine with both feet, hips and shoulders forward. The patient must move medially (towards you) so that the bottom of the IR is directly below the plane of the nipple (halfway between the ASIS and umbilicus). You should be standing on the medial side of the breast to be imaged.

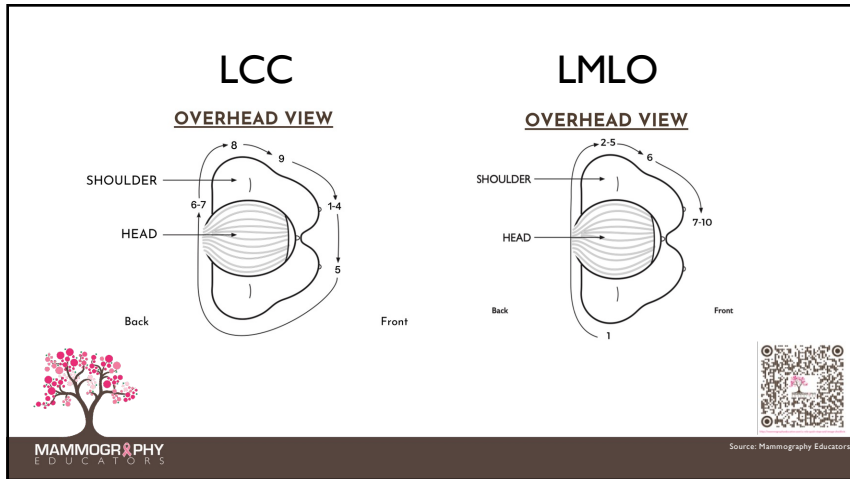
Steps below describe positioning for the **LMLC**.

1. Stand perpendicular to the patient with your sternum pressing against patient's right humerus
2. Lift patient's left shoulder/arm over the corner of the IR with your left hand in the patient's axilla. At the same time, your right hand should "meet" your left hand in the axilla and help to lift the patient's left shoulder up and over the IR
3. IR is placed in back of axilla (just inferior to latissimus dorsi)
4. Patient's left hand should be resting on bar, with their elbow bent behind the IR
5. Place your left hand on patient's left shoulder (if possible) to keep the shoulder relaxed and down
6. Your right hand, with palm facing up, slides down lateral side of breast to pull on lateral breast tissue and smooth out any skin folds
7. Once your right hand is at the bottom of the breast, turn your right hand over so that your hand is now palm down on the breast with the base of your thumb just anterior to the IMF
8. Push the breast up and out with the base of your thumb
9. At the same, ask the patient to lift and flatten their other breast. (Caution: Do not ask the patient to pull their breast back)
10. Continue to hold the breast in the up and out position until compression is complete

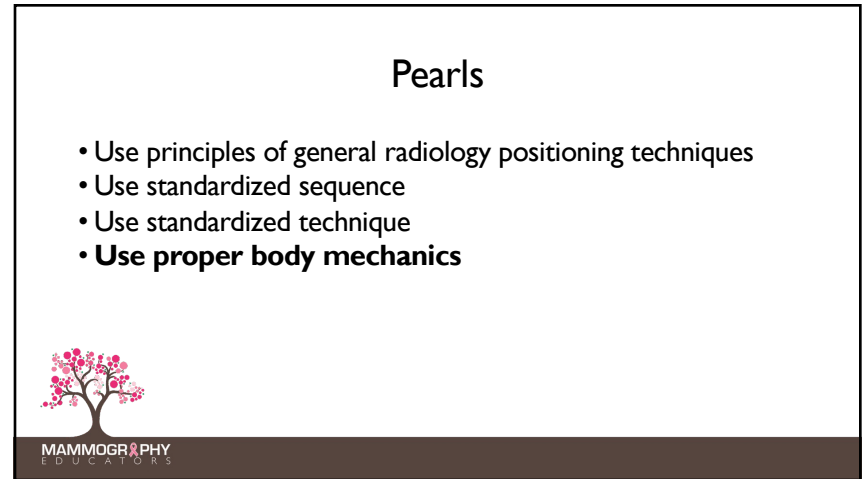


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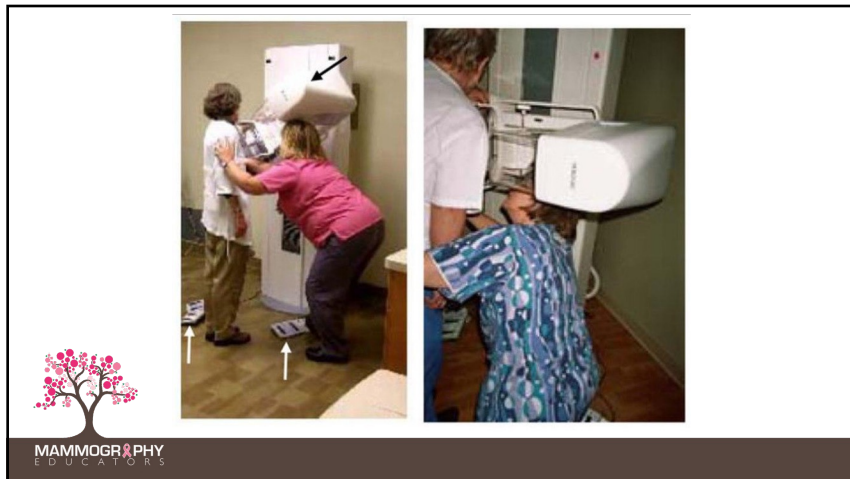
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40

My Mom Says So!



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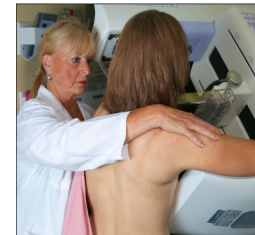
And Stand on the **Medial** Slide of the Breast to be Imaged



42

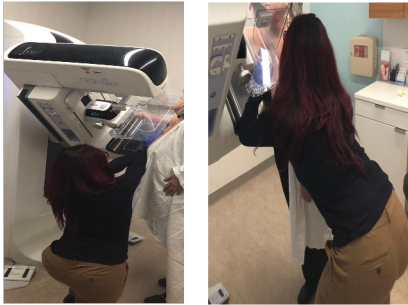


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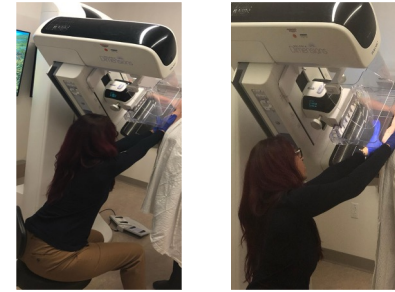
No “Lunging”!!



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Sitting is NOT Recommended for MLO



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Technologist Sitting for the MLO is NOT Recommended *Unless*:

- The patient is extremely short, or the technologist has previous injuries or pain that prohibits standing
- Sitting is usually the cause of shoulder pain and injury and will exacerbate the problem



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Tall Patient – Short Technologist



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Tall Technologist – Short Patient



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“Walking Around” to Place the Shoulder



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CORRECT METHODS



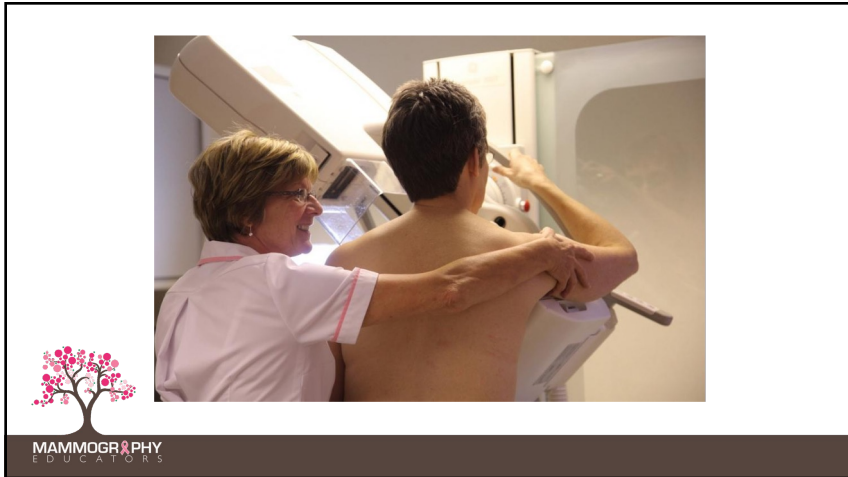
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51

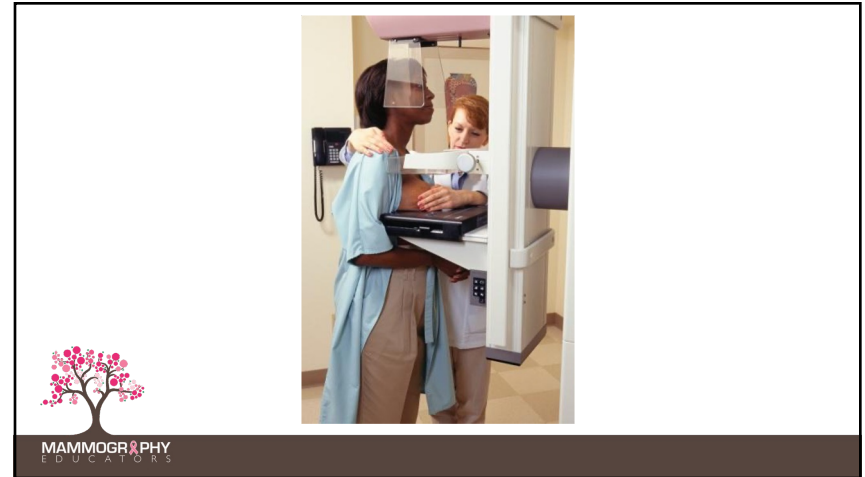


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53



54

Suggestions for Improvement

- Use equipment controls and foot paddles to eliminate stretching
- Keep elbows and hands below shoulder level
- Stand up straight!!
- Make sure patient is in proper position (facing machine with both feet, hips, and shoulders)



55

Suggestions for Improvement

- Stand close to the patient and use your whole body to position her
- Stand on the medial side of the breast being imaged for CC and MLO
- Use flats of your hands and the base of your thumb to support and position the breast



56

Control the Patient With Your Body



57

Hand Position is Important for the CC and MLO



58

Hand Position

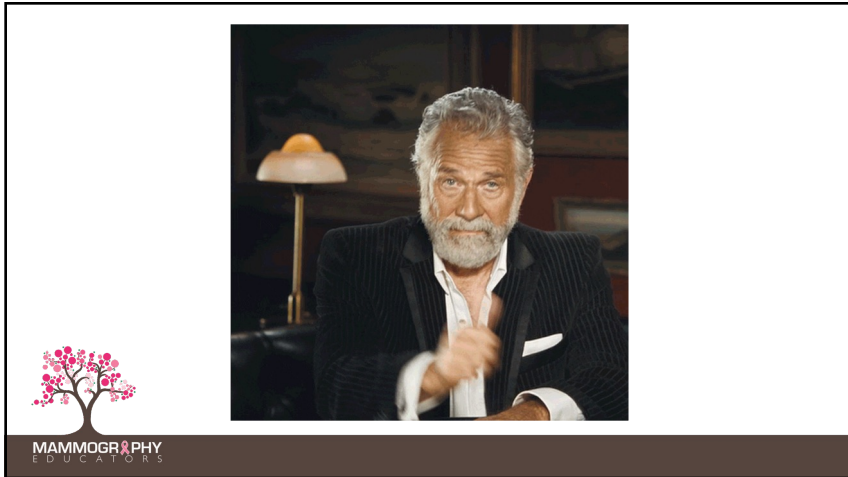


59

Thumbs Up!



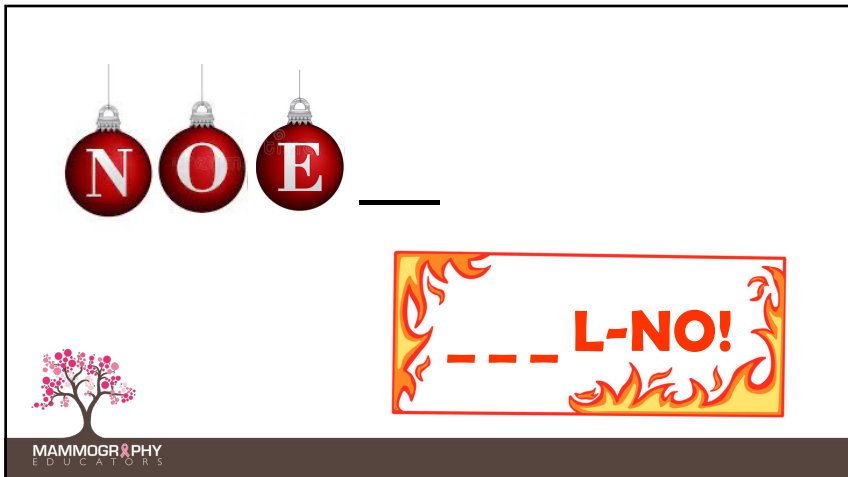
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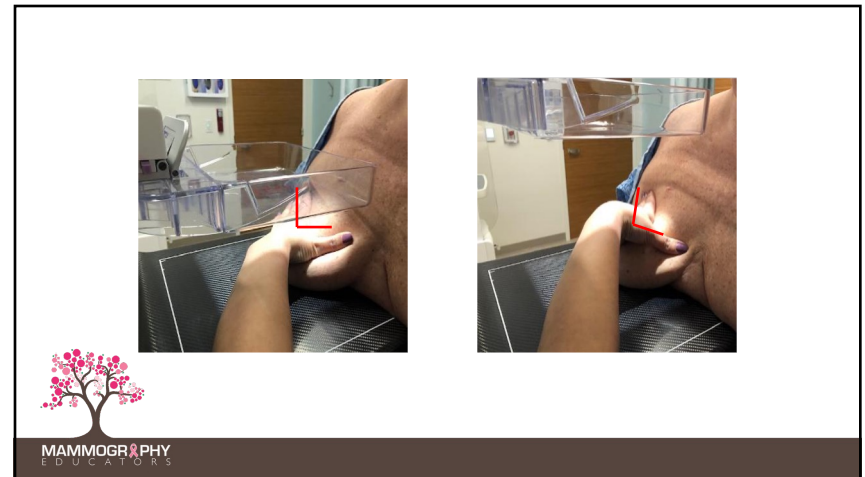
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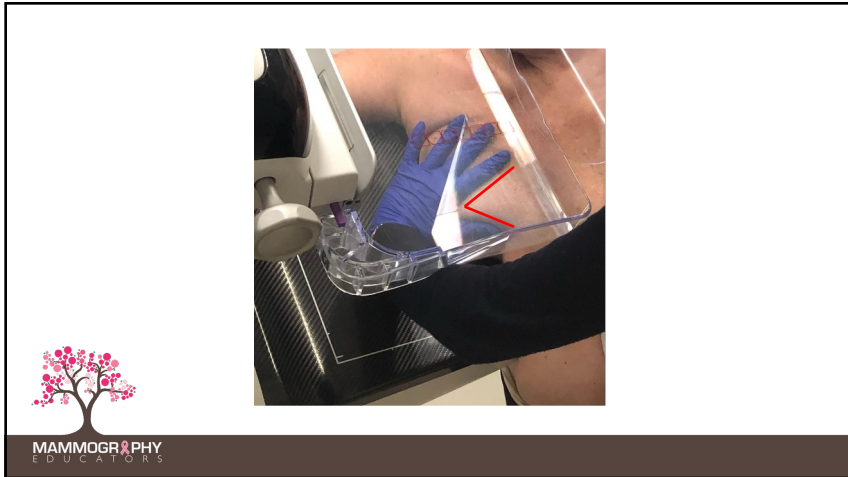
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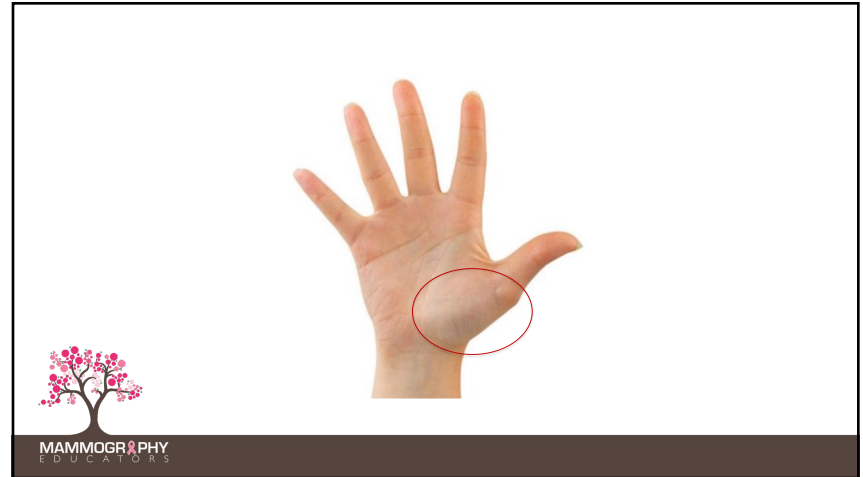
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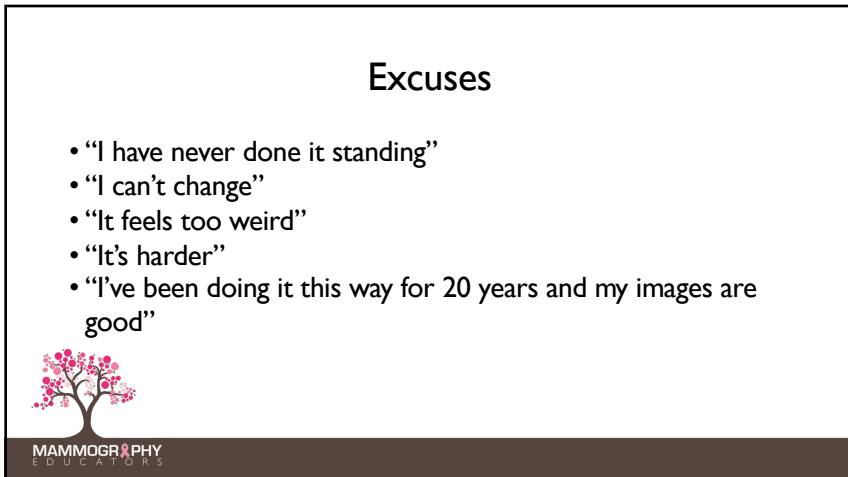
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66

Excuses

- “I have never done it standing”
- “I can’t change”
- “It feels too weird”
- “It’s harder”
- “I’ve been doing it this way for 20 years and my images are good”



67

Pitfalls



68

Pitfalls

- **Not** using principles of general radiology positioning techniques
- **Not** using standardized sequence
- **Not** using standardized technique
- **Not** using proper body mechanics



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Results

- Inefficiency: takes more time, more work
- Loss of proficiency: more repeats, poor images
- Positioning-related injuries: wrist, shoulder, back etc.



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When are you going to learn that your life would be so much easier if you would just do what I tell you to do?




your eCards
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If you would just do what I tell you, I wouldn't have to be so bossy.



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