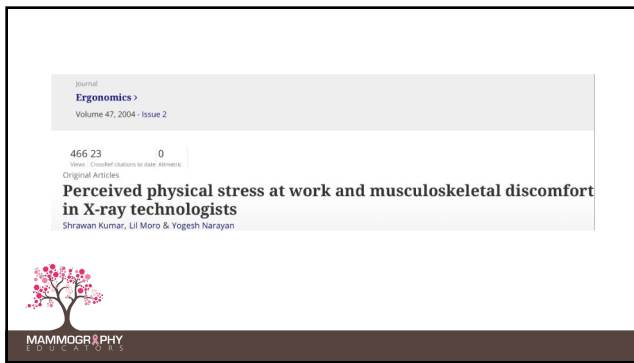


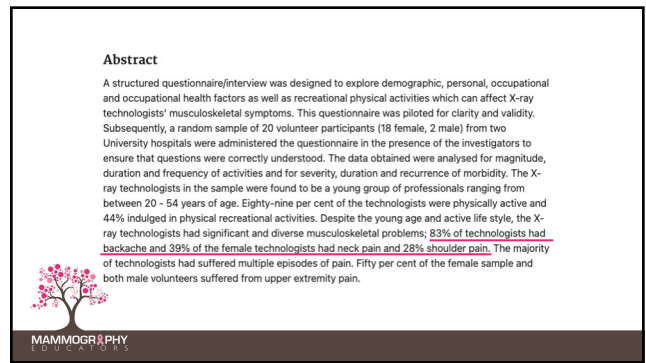
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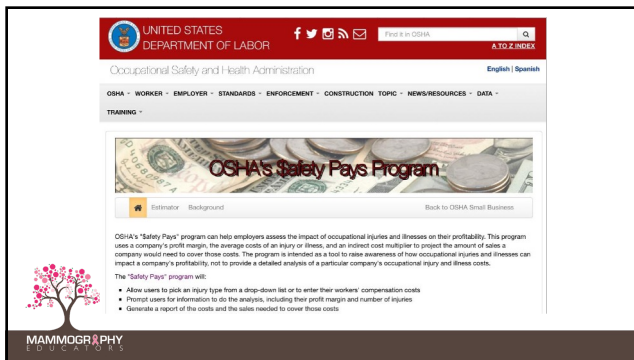
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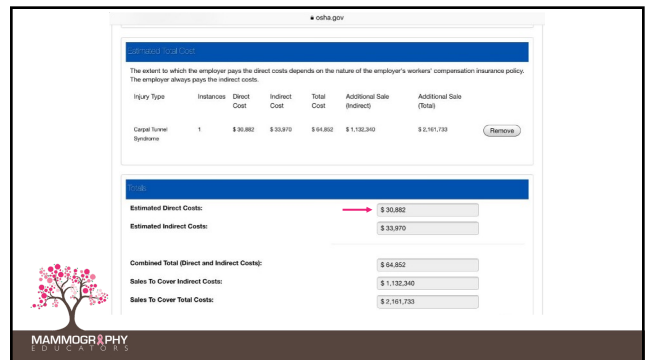
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6

Injury Type	Instances	Direct Cost	Indirect Cost	Total Cost	Additional Sale (Indirect)	Additional Sale (Total)
Carpal Tunnel Syndrome	1	\$ 30,892	\$ 33,970	\$ 64,862	\$ 1,132,340	\$ 2,161,733

Estimated Direct Costs: \$ 30,892

Estimated Indirect Costs: \$ 33,970

Combined Total (Direct and Indirect Costs): \$ 64,862

Sales To Cover Indirect Costs: \$ 1,132,340

Sales To Cover Total Costs: \$ 2,161,733

7

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8

### What About Breast Imagers?

- Ultrasonographers
- Mammographers

9

### What About Breast Imagers?

- Ultrasonographers
- Mammographers

10

SOCIETY OF DIAGNOSTIC MEDICAL SONOGRAPHY  
Susan Murphy, BS, RDMS, RDCS, CECD  
WHITE PAPER SERIES

90% of clinical sonographers experienced symptoms of WRMSDs<sup>6</sup>

Costing employers over **\$120 billion yearly** in direct and indirect costs<sup>2</sup>


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### What About Breast Imagers?

- Ultrasonographers
- Mammographers

12

No published studies on mammography related pain and injury.




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### Most Common Causes of Musculoskeletal Pain Problems

- Repeated movements
- Sustained postures

Particularly when performed with improper alignment or mechanics!




Source: Sahrman, SA, 2011

14

### Common Pain and Injury

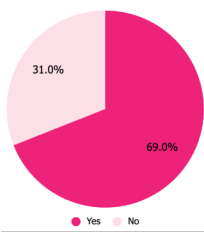
- Shoulder
- Wrist
- Neck
- Back



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Do you (or have you had) workplace injuries that you feel are related to mammography positioning?



Response	Percentage
Yes	69.0%
No	31.0%

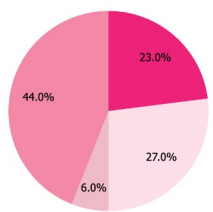
● Yes ● No




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If you have had a positioning-related injury did this cause any of the following:



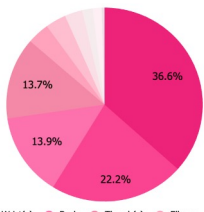
Consequence	Percentage
Surgical Intervention	23.0%
Time-off Work	44.0%
Early Retirement	27.0%
None of the Above	6.0%




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If you have had a positioning-related injury, where was the injury?

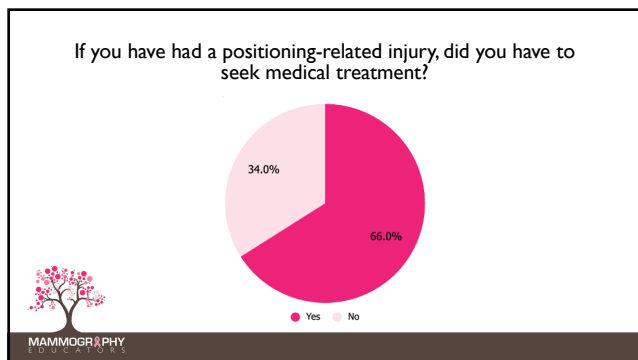


Location	Percentage
Shoulder(s)	36.6%
Wrist(s)	22.2%
Back	13.7%
Thumb(s)	13.9%
Elbows	13.7%
Other	13.7%
Feet	13.9%
Hand(s)	13.9%
Hip(s)	13.9%
Knees	13.9%



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- ### Causes
- Equipment design
  - Improper use of equipment
  - 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

20

- ### Causes
- **Equipment design**
  - Improper use of equipment
  - Lack of updated standardized training
  - Little or no consistency and reproducibility in positioning sequence
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  - Lack of use of proper body ergonomics

21

- ### 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%

22

- ### Causes
- Equipment design
  - **Improper use of equipment**
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  - Lack of use of proper body ergonomics

23



24



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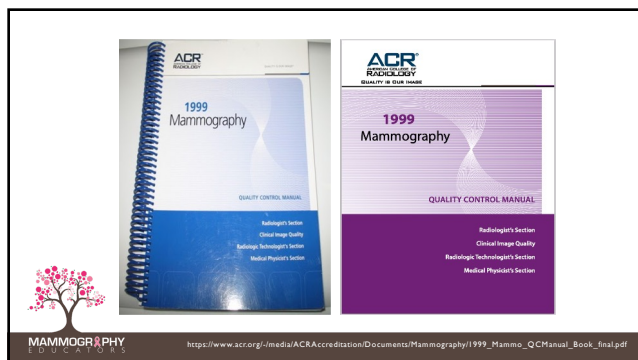


27

### Causes

- Equipment design
- Improper use of equipment
- **Lack of updated standardized training**
- Little or no consistency and reproducibility in positioning sequence
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28



29

### Causes

- Equipment design
- Improper use of equipment
- 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

30

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



31

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



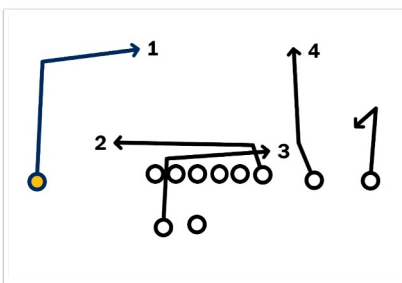
33

### Causes

- Equipment design
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- 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

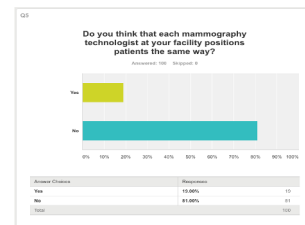


34



35

Most technologists do not practice a standardized method of positioning.



36

### 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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### 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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## STANDARDIZATION IS KEY!!




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## WHY???

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




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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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## Causes

- Equipment design
- Improper use of equipment
- 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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## Quick Steps for the LMLO

The following steps should be performed AFTER:

1. The proper compression size is chosen and shifted, as needed
2. The proper degree of angulation is determined and selected on the gantry
3. The IR is lowered, as needed



Source: Mammography Educators

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## Quick Steps for the LMLO

**Patient Preparation:**

- Stand on the medial side of the breast to be imaged
- Patient is facing the machine with both feet, hips and shoulders forward and level
- Patient should 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)






Source: Mammography Educators

48

### Quick Steps for the LMLO

1. Stand perpendicular to the patient with your sternum pressing against patient's right humerus
2. Lift patient's left shoulder/arm up 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, keeping continuous contact with the breast (Don't let go)
9. At the same, ask the patient to lift and flatten their other breast, as needed. (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

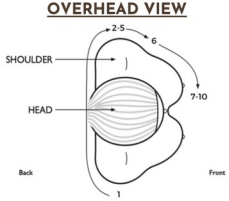





MAMMOGRAPHY EDUCATORS Source: Mammography Educators

49

### Quick Steps for the LMLO

**OVERHEAD VIEW**



MAMMOGRAPHY EDUCATORS Source: Mammography Educators

50

### Quick Steps for the LCC

The following steps should be performed AFTER:

1. The proper compression size is chosen
2. Machine is at 0 degree angulation



MAMMOGRAPHY EDUCATORS Source: Mammography Educators

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### Quick Steps for the LCC

Patient Preparation:

- Stand on the medial side of the breast to be imaged
- Patient is facing the machine with feet, hips and shoulders facing forward and level
- Patient should be standing back about 2" from the IR with the nipple centered to the IR (or as close as possible)






MAMMOGRAPHY EDUCATORS Source: Mammography Educators

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### Quick Steps 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/contralateral breast onto IR with your left hand, palm facing up, 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

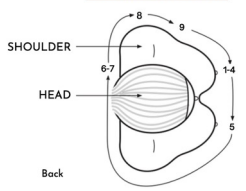





MAMMOGRAPHY EDUCATORS Source: Mammography Educators

53

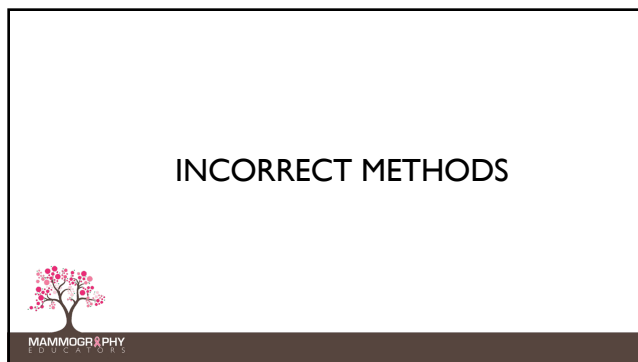
### Quick Steps for the LCC

**OVERHEAD VIEW**

MAMMOGRAPHY EDUCATORS Source: Mammography Educators

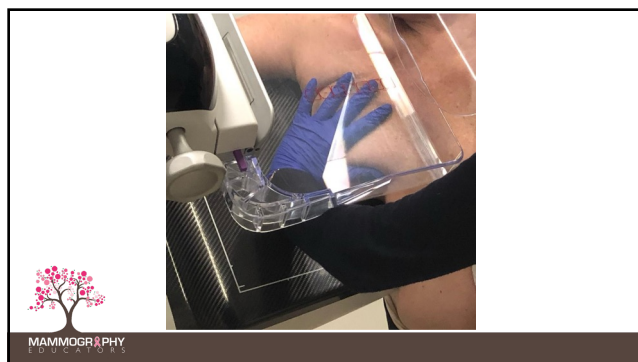
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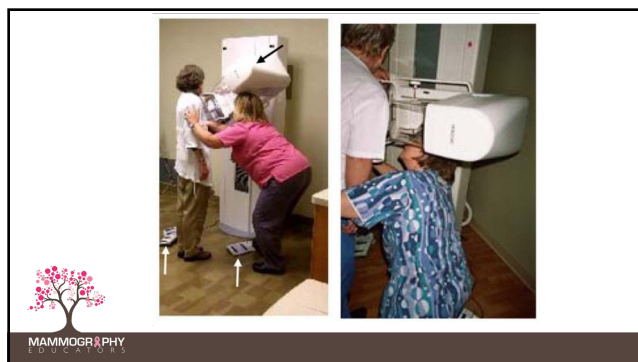
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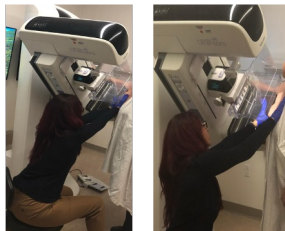


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### Sitting is NOT Recommended for MLO



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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 actually exacerbate the problem.



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### Tall Patient – Short Technologist



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### Tall Technologist – Short Patient



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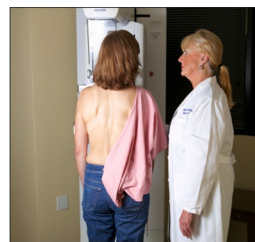
### Positioning Techniques That Use Proper Ergonomics



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### Stand Up Straight!



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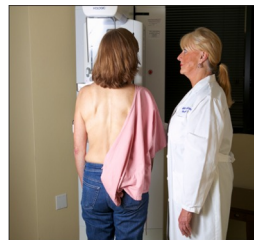
My Mom Says So!



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



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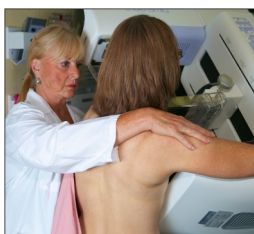
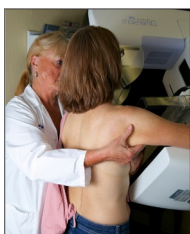
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Thumb Up and Elbow Below Shoulder



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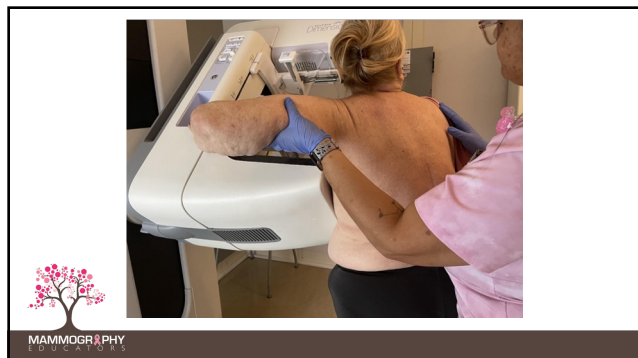
71

“Walking Around” to Place the Shoulder



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### 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)

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### Suggestions for Improvement

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

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### Control the Patient With Your Body

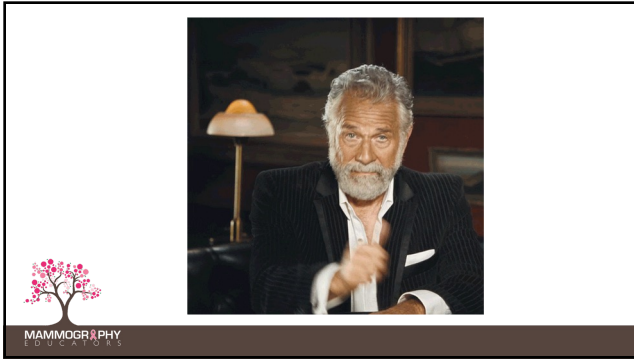
76

### Hand Position **IS** Important for the CC and MLO

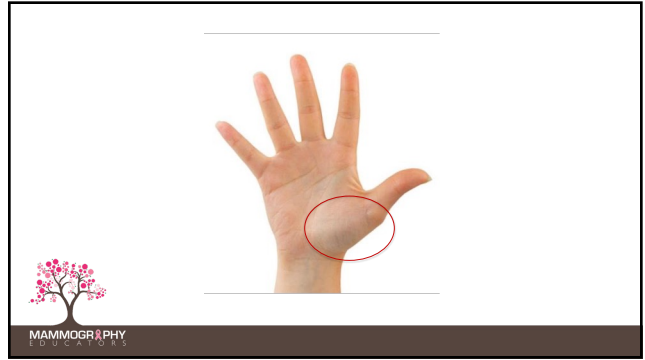
77

### Hand Position

78



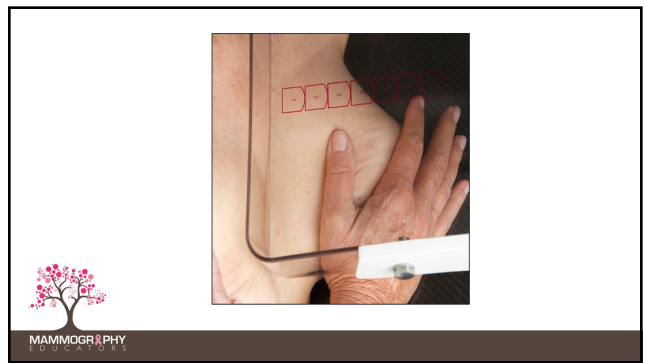
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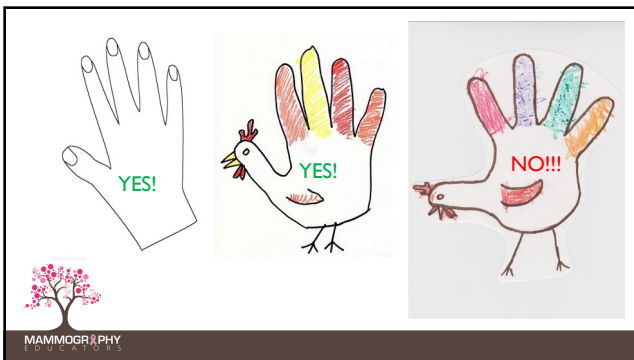
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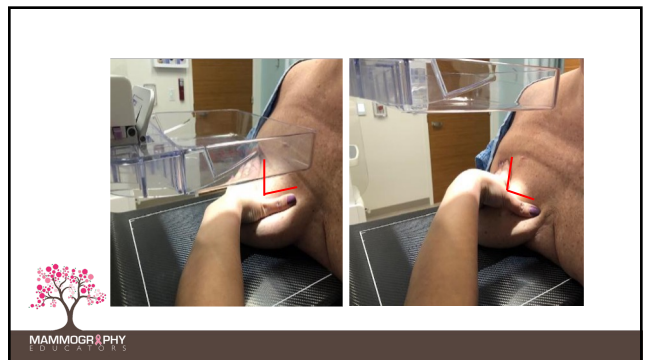
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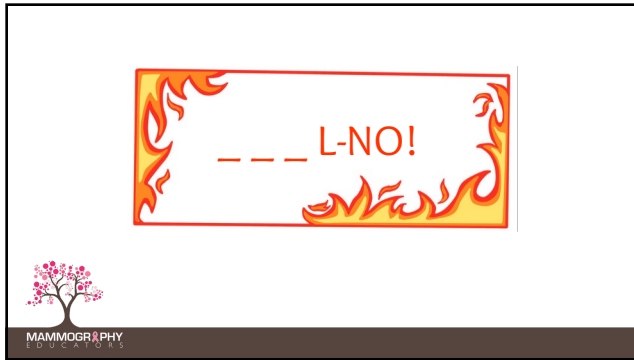
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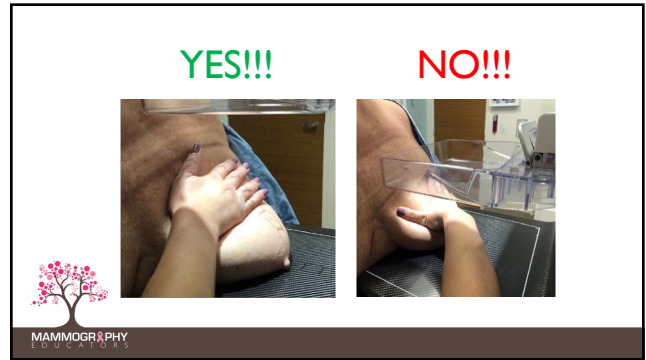
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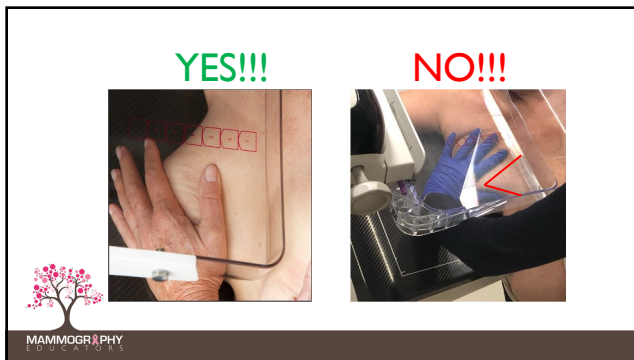
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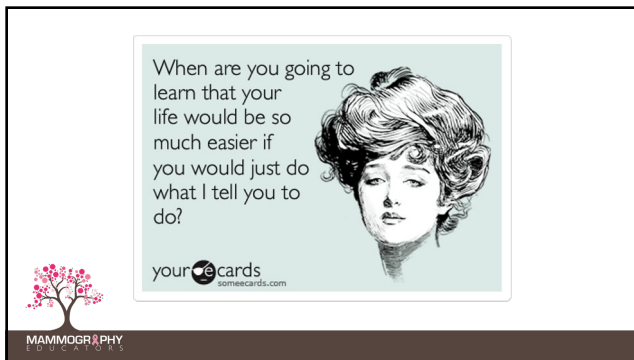


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### Resistance


- 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

88



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### Taking Care of Yourself!



#### 8 WAYS TO TAKE CARE OF YOURSELF


- 1 Eat well
- 2 Get physical
- 3 Get some sleep
- 4 Learn to prioritize
- 5 Take a break
- 6 Maintain your own personal interests
- 7 Try a mindfulness practice
- 8 Look out for each other

TO TAKE CARE OF OTHERS YOU NEED TO FIRST TAKE CARE OF YOURSELF

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### Simple Exercises Can Reduce Pain and Potential Injury



- Hands/wrists
- Neck and shoulder



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### Coming Soon.... Or Already Here!




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### How Can We Make Things Better?

- Consistency
- Reproducibility
- The proper use of body mechanics



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### Thank You!

Services we offer, include:

- Onsite Positioning Training
- Assistance with Accreditation & Inspection
- Live Webinars and Conferences
- On-Demand Continuing Education

For questions or more information:

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[mammographyeducators.com](http://mammographyeducators.com)  
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