TECHNOLOGISTS' COLUMN

The Cost of Poor Positioning: Avoiding Workplace Injuries by Using Proper Positioning Techniques

By Louise C. Miller, RT(R)(M)(ARRT), CRT, FSBI, FNCBC

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Since the inception of the Mammography Quality Standards Act and accreditation processes over 30 years ago, poor image quality, predominantly secondary to poor positioning, continues to be the primary reason for accreditation failure. Moreover, poor positioning decreases cancer detection sensitivity by 18.1%.[1] Consistent, reproducible, efficient, proficient, and ergonomically sound techniques produce far superior images.[2] Many technologists are still practicing outdated techniques because of the few opportunities for technologists to receive updated, standardized hands-on training that emphasizes the need to use appropriate body mechanics. Despite every technologist's best intention, incorrect positioning techniques are passed on to others. Technologists increasingly report positioning-related injuries that cause them to lose work time and sometimes their jobs, exacerbating an existing shortage of qualified mammography technologists. Skilled mammographers are hard to find and often hard to keep because of highly competitive salaries and a shortage of younger technologists choosing mammography as older mammographers retire.

Consequently, it is important to consider practical ways to ensure that mammography technologists stay healthy and avoid positioning-related injuries. Most injuries related to general radiologic technology are repetitive motion injuries (RMIs).[3] Many studies have investigated the effects of these injuries on ultrasonographers. Ninety percent of clinical sonographers report work-related musculoskeletal disorders. These disorders are the most frequently reported cause of restricted or lost work time, which can cost employers an astonishing $120 billion each year in direct and indirect costs.[4]

Although no data specifically related to mammography positioning and RMIs have been published, it is safe to assume that these injuries will affect mammographers who do not practice positioning techniques that are ergonomically sound. It is unfortunate that there is no real standard for the teaching and use of correct body mechanics. If this is not taken into consideration in the training of future technologists, this trend could continue, as it has with ultrasonographers. According to informal surveys, over 50% of mammographers feel that they have work-related pain and have incurred injuries related to positioning. The good news is that many ergonomically incorrect techniques can easily be changed!

Although some injuries are caused by a patient inadvertently grabbing or falling on the technologist, analysis shows that the most common causes of potential injuries in mammographers fall into two categories: RMIs and ergonomically incorrect use of the core muscles and extremities.

Repetitive Motion Injuries

A technologist positions breasts hundreds of times a week and thus repeats each step or movement over and over. If the technologist does not employ proper positioning techniques, these repeated movements can lead to pain and injury. The sites that most commonly develop RMIs are hands, wrists, and shoulders. Simple changes in hand and wrist position are illustrated in Figures 1 through 4.

1

Figure 1. Correct hand and wrist position for the craniocaudal (CC) view. The hand, wrist, and forearm are straight and in the appropriate position. The base of the thumb is anchoring the breast, which will help ensure visualization of more posterior, superior breast tissue and a higher probability of visualizing the pectoralis muscle.

2a

2b

Figure 2. Incorrect hand and wrist position for the CC view. Note the separation of the thumb from the index fingers and flexion of the wrist. This position can contribute to repetitive motion injuries and also may exclude visualization of posterior, superior tissue and decrease the possibility of visualizing pectoralis muscle, which should be seen on approximately 50% of all CC views.

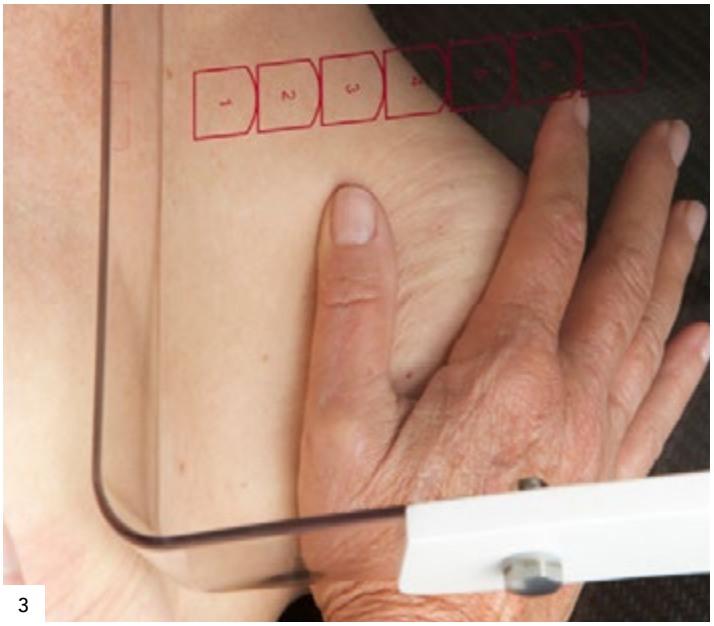

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Figure 3. Correct hand and wrist position for the mediolateral oblique (MLO) view. The technologist's hand should be palm down, with minimal flexion, using the base of the hand to stabilize the breast and help ensure visualization of the inframammary fold. This position helps support the breast in the up and out position as compression is applied.

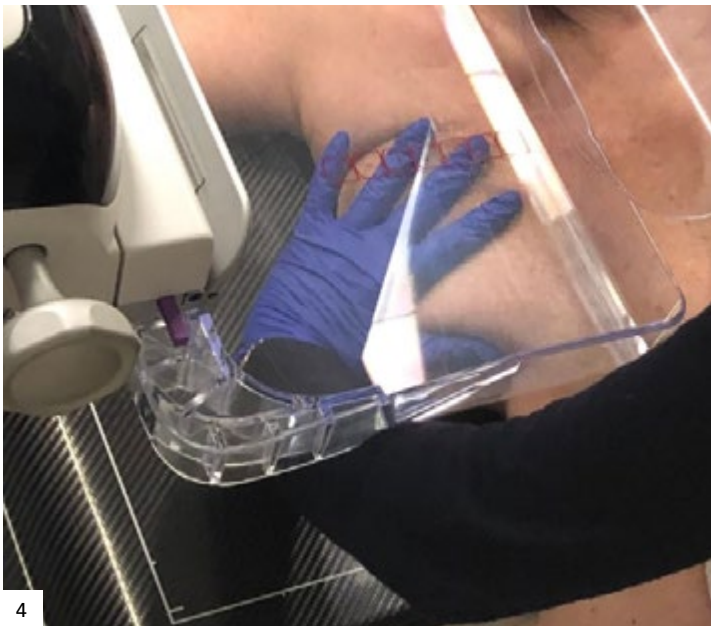

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Figure 4. Incorrect hand and wrist position for the MLO view. Note the extreme flexion of the technologist's wrist and hand. Placing the thumb in the inframammary fold can cause unnecessary skin folds in the inframammary fold and will not support the breast as compression is applied.

Ergonomically Incorrect Use of Core Muscles and Extremities

Whenever possible, the technologist's body should be upright while positioning a patient for the craniocaudal and mediolateral oblique (MLO) views (Figures 5 through 8). Good posture is essential to avoid unnecessary and potentially harmful bending of the back and neck. Whenever possible, elbows should not be raised above shoulder level.

5a 5b

Figure 5. Correct technologist core position for the CC and MLO views. For both views the technologist should approach the patient from the medial side of the breast being imaged.

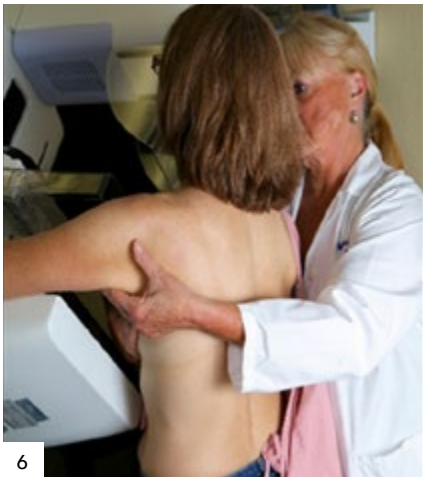

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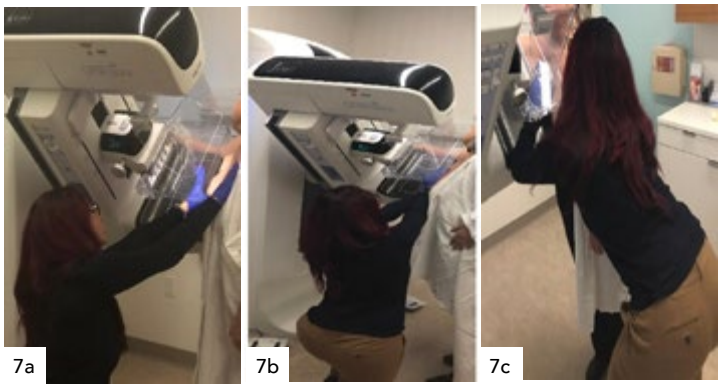
Figure 6. Correct technologist core position for the MLO view.



7a 7b 7c

Figure 7. Incorrect technologist core position for the MLO view. Note the incorrect back position causing excessive flexion and extension of the spine. The elbows are extended above shoulder level. All of these incorrect positioning methods can contribute to repetitive motion injuries.

Other Considerations

Sitting for MLO Views?

Many technologists, especially those who are very tall, report that sitting on a stool to obtain MLO views is beneficial. Sitting prevents them from having to bend around the tube head to visualize the breast while positioning. Each technologist should consult a physician or a qualified physical therapist about the position that will work best to prevent pain and avoid injury. If it is absolutely necessary for the technologist to use the seated position, special

care should be given to shoulder movement because from this position the technologist will have to repeatedly elevate the hands, arms, elbows, and shoulders while positioning the patient. Repeated elevation of the shoulders is one of the major causes of RMI and should be avoided when possible. Therefore, sitting to perform positioning is not generally recommended because of the ergonomic issues described in this article and should not be considered a standard for patient positioning. The recommended standard method results in a more efficient patient examination and experience with minimal effort on the technologist's part.

Technologist and Patient Size Variability

Due to the wide variety of patient and technologist body types and flexibility, not every technologist can position each patient using the same technique. Technique modifications are recommended to address these challenges. However, every effort should be made to use consistent, reproducible, efficient, and ergonomically sound positioning techniques to create the best examination and patient experience possible.

References

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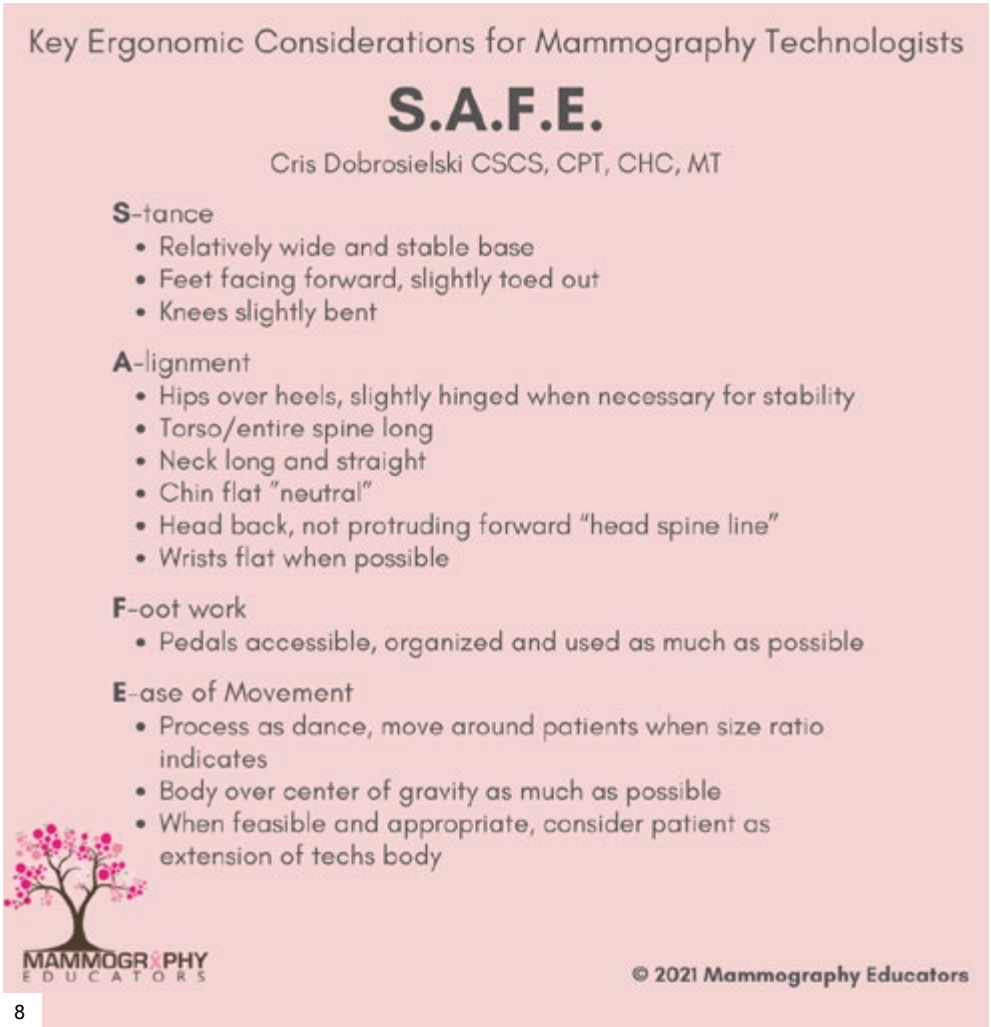

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Figure 8. Ergonomic recommendations for mammography technologists. Published with permission.