Breast MRI:
The Technologists' New Challenge!

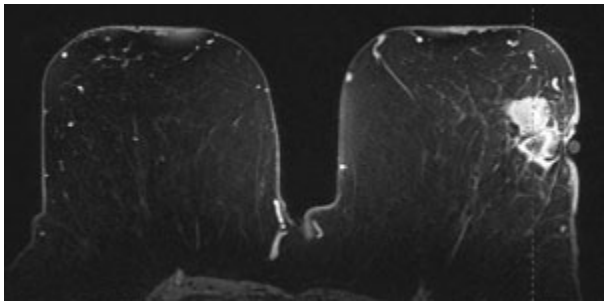
Breast MRI Imaging is new, exciting and challenging. Positioning is *key* to imaging the entire breast properly. Patient cooperation is essential; the slightest motion can make the entire exam undiagnostic. As technologists our challenge is to get high quality images while taking care of the patient at the same time.

Usually by the time that the MRI patient gets to us, they are already apprehensive, worried, stressed, or all of the above. MRI is chosen for most of these patients because they have a finding that concerns the radiologist on another imaging modality or they have very strong risk factors for breast cancer (1). Because breast MRI is usually done subsequent to mammograms and/or ultrasound, we rarely get the carefree, relaxed patient. Remember to consider what the patient has already endured when they come in for their breast MRI.

Some things we can do as technologists to ensure, or at least attempt to ensure, high quality scans are:

- position correctly
- make the patient comfortable
- give clear instructions
- create a relationship
- be professional
- set boundaries.

When positioning a patient for a breast MRI, place the patient prone into the coil with their face down into the holder and their arms relaxed above their head without hands clasped together. This could create a circuit inadvertently and cause localized heating or burns from radiofrequency induction. If the patient has had a recent mastectomy, you can help their discomfort by utilizing cushions and/or towels on top of a breast blocker so that their ribs are not pressed directly against the edge of the breast opening of the coil. Confirm that the breast hangs pendulously through of the center of the opening in the coil. Make sure that ONLY breast is in that opening (no adipose tissue from the abdomen, etc). Reach in and pull from all directions do ensure that you don't have any breast tissue bunched up between the patient and the coil. And lastly, utilize the coil's medial and lateral immobilization plates just to touch (not to compress) the breast – this stabilizes the breast and eliminates motion that can be caused by the vibration of the scan table especially during the dynamic sequences. Make sure that your radiologist approves of the use of the compression plates to touch prior to utilizing this on your patients – we want the radiologist to know why all his breast patients have "square" looking breast (see image below). In my experience, the radiologist will always choose "square" breast over breast with motion.



If your radiologists would like markers placed on the nipples, scars and palpable lumps, use caution in the placement of these markers. Using vitamin E or Cod Liver Oil capsules can cause an indention of the skin. The origin of this indention is difficult for the radiologist to determine – is it from the marker or is it architectural distortion caused from some underlying pathology? The solution to this problem is to use some of the markers designed specifically for the use in MRI that have the capsule on the outside of the adhesive surface. This design will not interfere with the interpretation of the exam while still marking areas of interest.

If your patient goes into the scanner head first and your injector reaches around to the back of the scanner, then this is the best way to attach. If the injector will not reach around, then make sure that the tubing goes down the center of the patient's spine – when the tubing goes down the patient's side, it can wrap in the image and look like an artifact on the other breast. If your patient goes into the scanner feet first, you can, of course, just attach the injector as normal. If you have the patient's IV started in the anterior elbow, the slight bend of the arm should not at all affect the flow of the contrast or the patient's comfort in my experience.

Making the patient comfortable is worth the extra time. Below are some things I utilize to help the patient and thus get the highest quality images possible.

- Always change the patient completely into a gown. The button or zipper of pants can make your fat saturation poor or even completely unobtainable

- Patients with back problems might benefit from a sheet or small pillow under the upper pelvis to decrease the arch of the lumbar area.

- Patients with sinus issues or that have longer necks may need the head holder raised higher than that of the average patient.

- Bringing the arms above the head when positioning the patient in the breast coil is something that I always do, it not only adds stability, but most of the time just feels more natural - Yes, their hands may go numb, but with the arms to their side more pressure is put on their forehead and sternum which becomes very uncomfortable after 15 minutes or so. If the patient is physically unable to bring one or both arms up, place the arms at the side and remember to strap their arms at the elbows to help them hold that arm in place and when they return for their next exam put their arms in the same position. Remember that all breast imaging is about consistency.

- Sometimes a thin cushion under the elbows will take pressure off the arms and remind the patient to relax their shoulders – you don't want the patient holding themselves up on their elbows for the exam.

- Put a pillow or cushion under their ankles to place them in a more normal anatomical position.

- Put a disposable bouffant cap on the patient if needed to hold back their hair while they are prone in the breast coil. Hair hanging down can make the face itch and we don't want the patient to lift up their head to scratch their nose!

- Blankets…I play this one by ear. If the patient is cold I will give them a sheet (especially over the feet) but if they say that they are just a little cool, I discourage any covers because of the heat we are going to create during the dynamic scans. I have been told that there is nothing worse than trying to hold still as sweat rolls down your back.

- Make sure that the patient can see out of the scanner using the mirror in the head holder and that she knows not to raise their head at any time during the scan.

- Immobilization devices. I usually place a strap lightly across the upper shoulders to remind the patient not to move their shoulders or arms, but this may not be a good idea if the patient is claustrophobic.

Giving the patient instructions is part of our everyday job, but with breast MRI I have found that giving these instructions before the patient arrives to the facility and including family/friends in these instructions is helpful. If the patient is thinking about getting to another appointment, picking up the kids, or worrying about their family/friend waiting in the lobby your chances of getting a motion free exam are slim. I always overestimate the time needed for the exam, so that if I need extra time I have it and when I finish early I can give the patient some good news. This also gives the patient time to ask questions and get comfortable with the procedure.

Creating a relationship with your patient is sometimes very easy. A comment about the weather, a compliment about their shoes, etc. can go a long way. While maintaining your professionalism, when you connect with the patient, they view you as more of a friend than that mean tech that is trying to torture them. Some patients, either naturally or because of being nervous, will seem to be cold or distant and creating a relationship will be difficult, if at all possible. I believe that every patient deserves this effort, even if they don't seem open to small talk in the beginning, sometimes after completing the exam they will remember your kind effort.

We are breast imaging professionals even if we are new to breast imaging. Our patients don't know how many times we have performed this particular exam or if we are completely intimidated by breast imaging. Your confidence and professionalism will make the patient comfortable as long as you can maintain a healthy balance of professionalism and warmness. My motto is "fake it till you make it" – display confidence to others until you truly feel confident in your skills.

Last, but most important, set boundaries. I saved this one for last because without some of the above efforts, your boundaries will not help. Either before or while positioning the patient for the scan, I very clearly explain to them the imperativeness of their cooperation. I let them know that one slight movement can render the entire exam undiagnostic. Your tone of voice is as important as the words you say. Be very clear, straight forward and look the patient in the eyes while telling them that during the entire exam, they can not move, wiggle, cough, etc. When performing the scan if I get patient motion on the localizer, I will go into the room and let the patient know that the series showed some motion and that I am going to try it again and for them to concentrate on relaxing and not moving. If the patient again moves, I stop the exam – if the patient can not hold still for a 40 second localizer then they can not hold still for a 7 minute dynamic scan. By performing multiple repeat exams you are adding to the stress that is already on yourself to get high quality images and on the patient. I have seen many a tech spend an hour or more and end up with nothing but a few more grey hairs! Know when to say "when" for your own sake as well as the patient and reschedule the exam on another day and/or with some medication.

Breast MRI is becoming more and more popular and with these methods, perhaps it will become an enjoyable exam for both the patient as well as the technologist.

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References:

1. ACS Guidelines, ACR Guidelines
2.