From the Mammo Room to the Reading Room: Diagnostic Edition

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Thank you to the following colleagues for their contributions to the lecture:

- Robyn Hadley, RTRM
- Sarah Jacobs, BS, RTRM
- Terry Lehman, BS, RTRM

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Diagnostic Scenarios

- Patient schedules for dx mammo due to sx
- Patient has screening mammo and returns for dx exam
- Patient schedules for screening mammo and now tells the technologist that she has a "lump" or experiencing "pain"

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Diagnostic Scenarios

- **Patient schedules for dx mammo due to sx**
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Communication and Documentation

Documentation is key:
- Electronic documentation
- Complete paper form/scan

Tech:__________

KVP:______ Density:______

DAY TELEPHONE#: (   )__________

PLEASE CHECK

YES	NO	Do you have any current breast complaints or problems?

Indicate below any scars, lumps, moles, and/or areas of concern:

R L

	Right	Left
☐ Scars	___	___
☐ Lump or Mass	___	___
☐ Moles	___	___
☐ Tissue Thickening	___	___
☐ Skin Thickening or Retraction	___	___
☐ Nipple Discharge	___	___
☐ Nipple Inversion or Retraction	___	___
☐ Pain	___	___
☐ Other ______	___	___
☐ Comments ______	___	___

YES	NO	
		Have you had a mammogram before? Location: ______ Date: ______ If your last mammogram was NOT at Stanford, please complete a FILM RELEASE FORM
		Have you had a breast *physical* examination by a health care professional? If yes when?______ If you have *not* had a breast *physical* exam, *you should have one within a month* of this mammogram by your own health care professional to complete the evaluation of your breasts.
		Do you have children? *Your* age at the birth of your first child______
		Date of the beginning of your last period, or ____ Date of menopause, or ____ Date of your hysterectomy ____
		Are you taking birth control or fertility drugs? If yes, began in 19____
		Are you taking hormones (estrogen/Premarin)? If yes, began in 19____ IF YES, WHY? ☐ menopause ☐ heart condition ☐ osteoporosis ☐ prior hysterectomy ☐ other
		Do you have rheumatoid arthritis?
		Have you or anyone in your family ever had breast cancer? ☐ Don't know ☐ MYSELF at age ___ ☐ MOTHER at age ___ ☐ GRANDMOTHER at age ___ ☐ SISTER at age ___ ☐ AUNT at age ___ ☐ DAUGHTER at age ___
		Have you had cancer? If yes, please describe what type: ______ Type of treatment: ☐ Radiation ☐ Chemotherapy ☐ Surgery
		Have you ever had breast surgery? IF YES, SEE BELOW.

DO YOU HAVE BREAST IMPLANTS?

YES _____ NO _____

If you answered yes to the question above, please indicate date, reason for surgery, and type of surgery below:

	Right	Date and reason, benign or malignant	Left	Date and reason, benign or malignant
Surgical biopsy	Right	______	Left	______
Needle biopsy	Right	______	Left	______
Cyst aspiration	Right	______	Left	______
Lumpectomy	Right	______	Left	______
Mastectomy	Right	______	Left	______
Breast Implants	Right	______	Left	______
Breast Reduction	Right	______	Left	______

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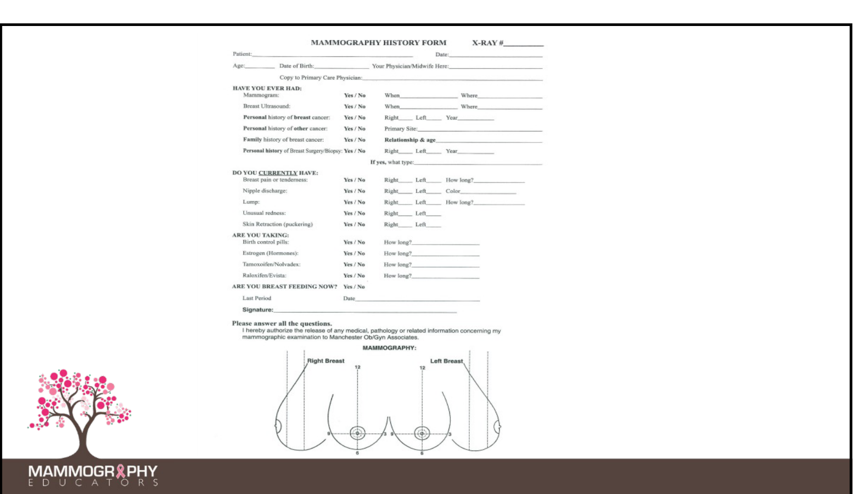

MAMMOGRAPHY HISTORY FORM **X-RAY #______**

Patient:______ Date:______

Age:____ Date of Birth:______ Your Physician/Midwife Here:______

Copy to Primary Care Physician:______

HAVE YOU EVER HAD:

Mammogram:	**Yes / No**	When______ Where______
Breast Ultrasound:	**Yes / No**	When______ Where______
Personal history of **breast** cancer:	**Yes / No**	Right____ Left____ Year______
Personal history of **other** cancer:	**Yes / No**	Primary Site:______
Family history of breast cancer:	**Yes / No**	**Relationship & age**______
Personal history of Breast Surgery/Biopsy:	**Yes / No**	Right____ Left____ Year______
		If yes, what type:______

DO YOU CURRENTLY HAVE:

Breast pain or tenderness:	**Yes / No**	Right____ Left____ How long?______
Nipple discharge:	**Yes / No**	Right____ Left____ Color______
Lump:	**Yes / No**	Right____ Left____ How long?______
Unusual redness:	**Yes / No**	Right____ Left____
Skin Retraction (puckering)	**Yes / No**	Right____ Left____

ARE YOU TAKING:

Birth control pills:	**Yes / No**	How long?______
Estrogen (Hormones):	**Yes / No**	How long?______
Tamoxoifen/Nolvadex:	**Yes / No**	How long?______
Raloxifen/Evista:	**Yes / No**	How long?______

ARE YOU BREAST FEEDING NOW? **Yes / No**

Last Period Date______

Signature:______

Please answer all the questions.
I hereby authorize the release of any medical, pathology or related information concerning my mammographic examination to Manchester Ob/Gyn Associates.

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Communication and Documentation

Clinical sx: (reported by MD)
- Location – laterality and quadrant
- Duration (acute/chronic)
- Tenderness
- Mobility
- Shape/borders

Communication and Documentation

Patient “reports” _______ pain/lump/nipple changes (discharge, inversion).

- Location – laterality/quadrant/focal/global
- Duration (acute/chronic)

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Protocols for Dx Workup

Clinical findings – use of markers:

- Pain (global or focal)
- Lump
- Asymmetry/lump maker or square AOC

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Apply appropriate skin markers per protocol utilizing consistent and standardized methods as recommended by ACR:

- Pellet: nipple
- Line: scar
- Circle: mole
- Square: pain
- Triangle: palpable abnormality

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Markers for Use in Dx Exams

THE RAISED TRIANGLE ONLY FROM BEEKLEY MEDICAL

TomoSPOT® for marking palpable masses 784
116 / box
•low density see-through triangle
•pinch-free material
•designed for use with 3D breast tomosynthesis equipment

THE RAISED SQUARE ONLY FROM BEEKLEY MEDICAL

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•low density see-through square
•pinch-free material
•designed for use with 3D breast tomosynthesis equipment

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Diagnostic Scenarios

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Protocols for Dx Workup

Radiographic findings:
- Calcifications
- Mass(es)
- Asymmetry – global/focal

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Communication and Documentation

Call-back for dx workup:
- Location - indicated on image(s)
- Additional views needed:
  - Repeat
  - CV, XCCL, LM/ML
  - Focal compression – Spot/Mag

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The Importance of Breast Imaging Protocols

- Creates consistency
- Establishes standardization among radiologists
- Increases efficiency

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Diagnostic mammography examination acquisition parameters:

- CC and MLO view(s):
  - Recommended sequence of views: RCC, LCC, LMLO, RMLO.
  - Follow standard departmental acquisition parameters.
- 90 degree lateral view(s) (LM/ML):
  - Follow standard departmental acquisition parameters.
- Spot compression and spot compression with magnification views:
  - Follow standard departmental acquisition parameters.

I. Palpable Mass[28]

Standard skin marker utilized during imaging: Triangle (see Section III for standardized skin marking guidance[29,30]).

The technologist's patient history notes should include:

- Laterality (left or right breast).
- Location with clock position, and/or quadrant (e.g. right 2 o'clock, RUOQ).

Patient history notes may also include:

- Date mass was first noticed.
- Approximate size and shape.
- Change in size or appearance since it was first noticed.
- Mobile or non-mobile.
- Associated pain.
- Whether the palpable mass was found by the patient or provider.

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Source: Mammography Educators

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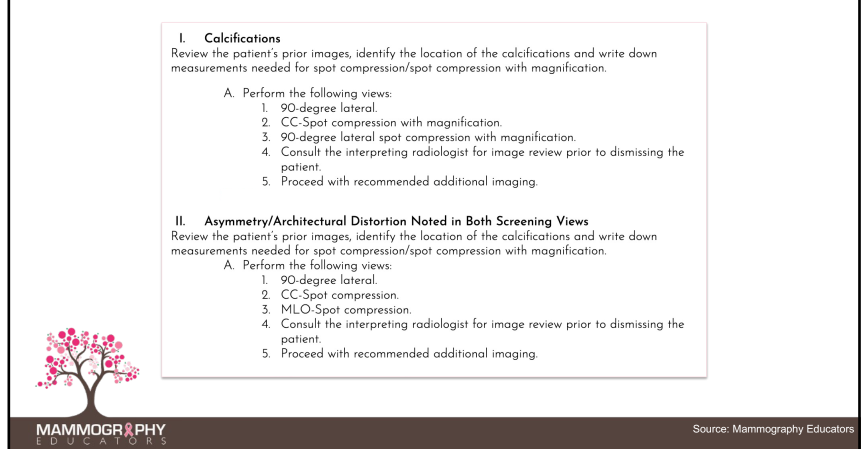

I. Calcifications

Review the patient's prior images, identify the location of the calcifications and write down measurements needed for spot compression/spot compression with magnification.

A. Perform the following views:
1. 90-degree lateral.
2. CC-Spot compression with magnification.
3. 90-degree lateral spot compression with magnification.
4. Consult the interpreting radiologist for image review prior to dismissing the patient.
5. Proceed with recommended additional imaging.

II. Asymmetry/Architectural Distortion Noted in Both Screening Views

Review the patient's prior images, identify the location of the calcifications and write down measurements needed for spot compression/spot compression with magnification.

A. Perform the following views:
1. 90-degree lateral.
2. CC-Spot compression.
3. MLO-Spot compression.
4. Consult the interpreting radiologist for image review prior to dismissing the patient.
5. Proceed with recommended additional imaging.

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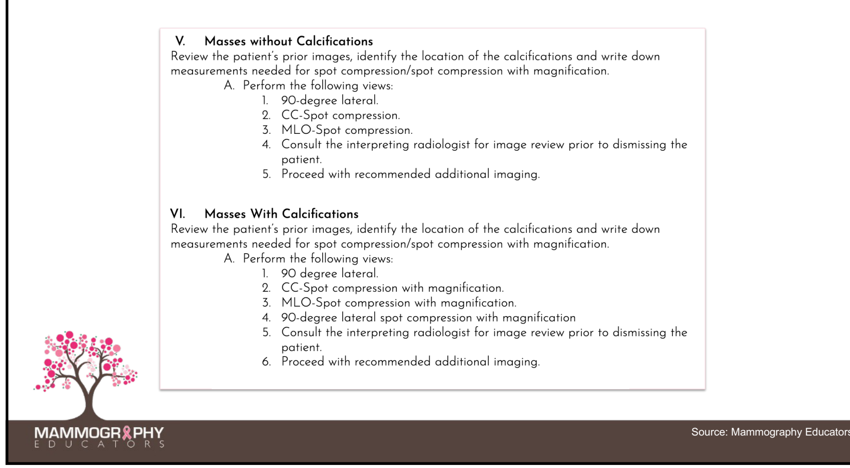

V. Masses without Calcifications

Review the patient's prior images, identify the location of the calcifications and write down measurements needed for spot compression/spot compression with magnification.

A. Perform the following views:
1. 90-degree lateral.
2. CC-Spot compression.
3. MLO-Spot compression.
4. Consult the interpreting radiologist for image review prior to dismissing the patient.
5. Proceed with recommended additional imaging.

VI. Masses With Calcifications

Review the patient's prior images, identify the location of the calcifications and write down measurements needed for spot compression/spot compression with magnification.

A. Perform the following views:
1. 90 degree lateral.
2. CC-Spot compression with magnification.
3. MLO-Spot compression with magnification.
4. 90-degree lateral spot compression with magnification
5. Consult the interpreting radiologist for image review prior to dismissing the patient.
6. Proceed with recommended additional imaging.

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Pre-Imaging Checklist:

1. Document location and dates of prior imaging.
2. Review prior imaging and reports available BEFORE imaging the patient.
3. Use protocols for additional view selection

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Common Dilemmas

- **Rad does not specify which views to do**
- **Rad does not identify AOC**
- Rad A reads exam and recommends dx workup, but Rad B says "I don't know what they are talking about"?

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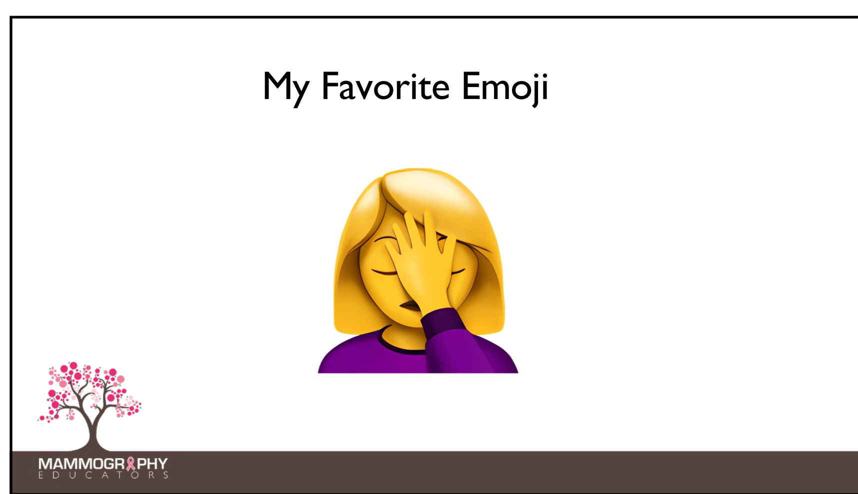
Common Dilemmas

- Rad does not specify which views to do
- Rad does not identify AOC
- **Rad A reads exam and recommends dx workup, but Rad B says "I don't know what they are talking about"?**



Bonus Dilemma

June 10 at 4:55 PM ·

earlier i did a baseline screening. i noticed the patient had architectural distortion, but hey she's a screening and im not a radiologist so i sent her on her way. later the radiologist comes and asks me why i didn't change the exam to a diagnostic with ultrasound if i had noticed the distortion. i told him because she was a screening, so i figured she would get called back anyway. he said next time to let someone know so they can change her exam to a diagnostic instead of having the patient leave. was i in the wrong to have her leave and not try to have the front desk staff get an order for a diagnostic? 😞 the patient stated she had no symptoms and wasn't aware of anything in her breast. to her this was just her first mammogram and i didn't really want to freak her out by making her wait to get an order approved.

edit: i also may add the radiologist was in a biopsy and i had 5 patients to do with 15 minutes before lunch 😞 i would have loved to talk to him about it but we were both busy! See less

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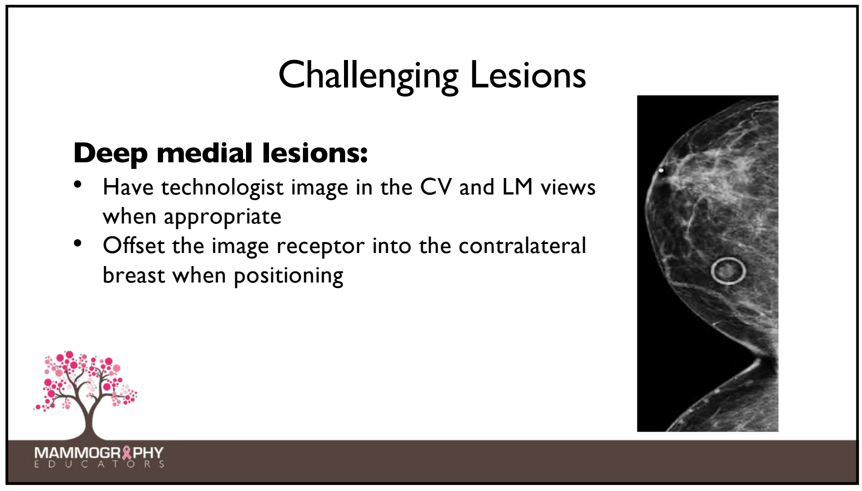
Challenging Areas of Concern (AOC)

- Deep medial lesions
- Deep axillary lesions
- Retroareolar lesions/concern



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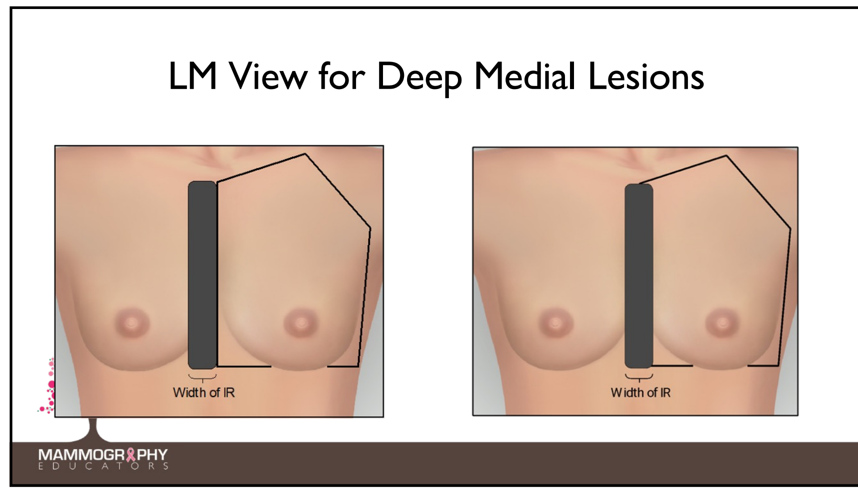

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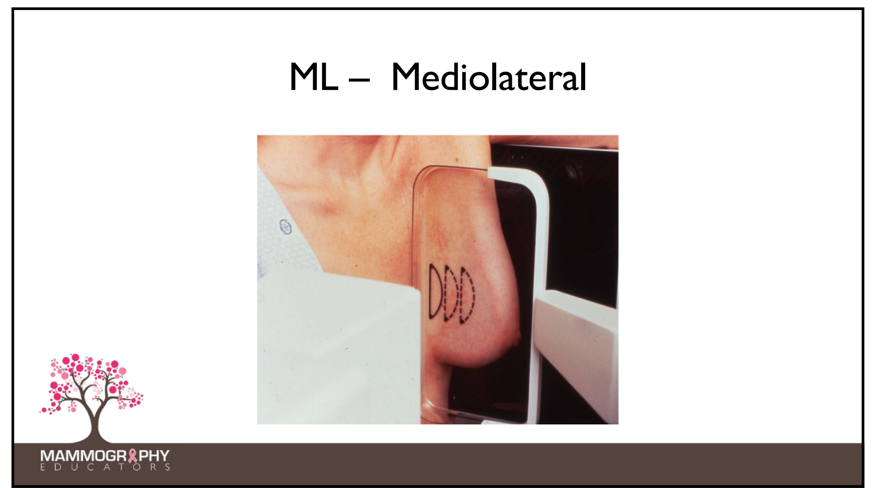

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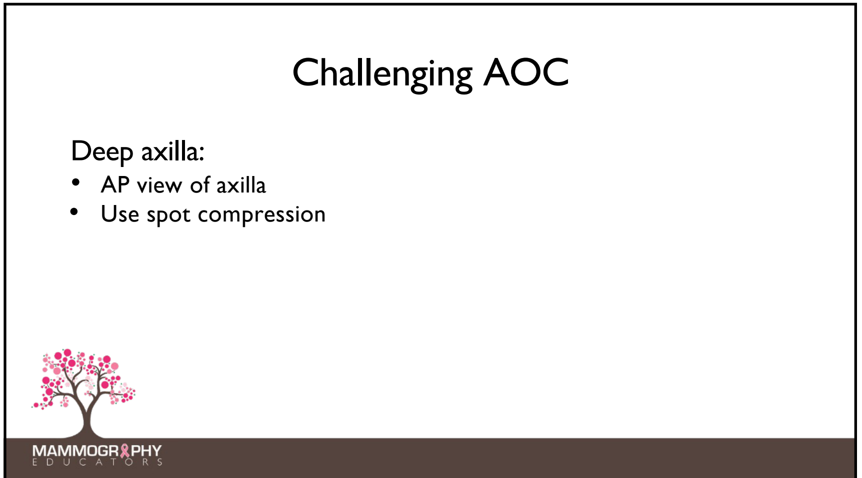

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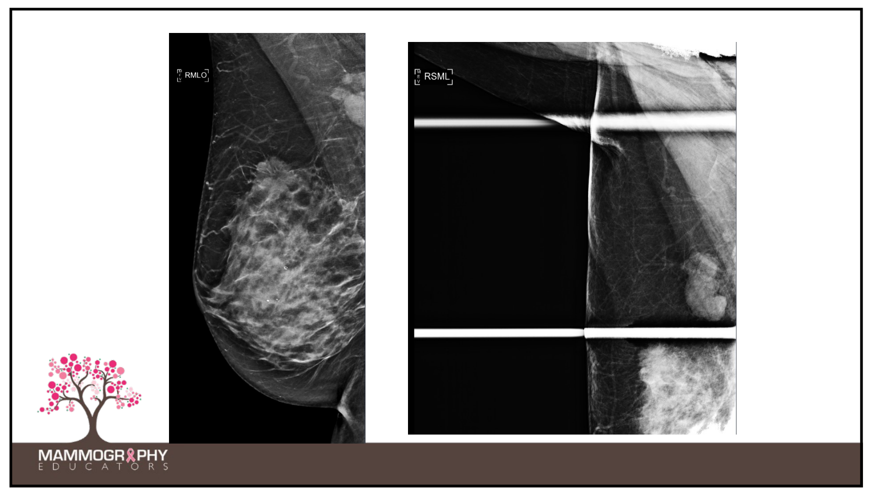

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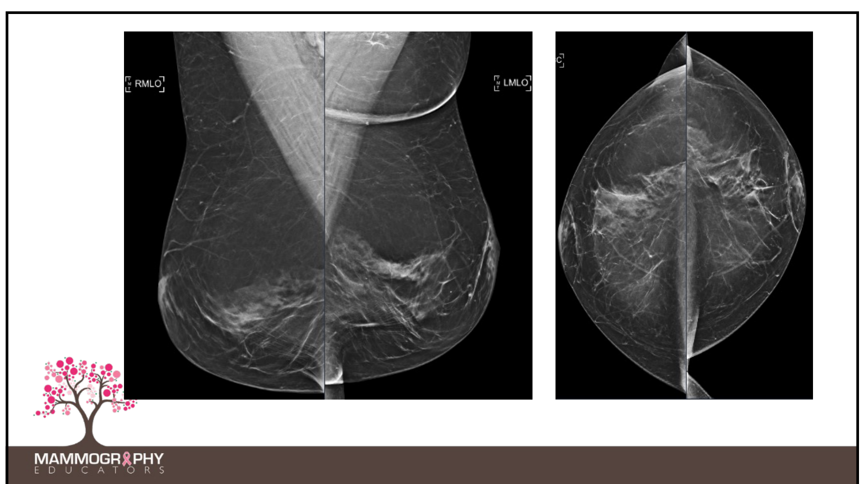

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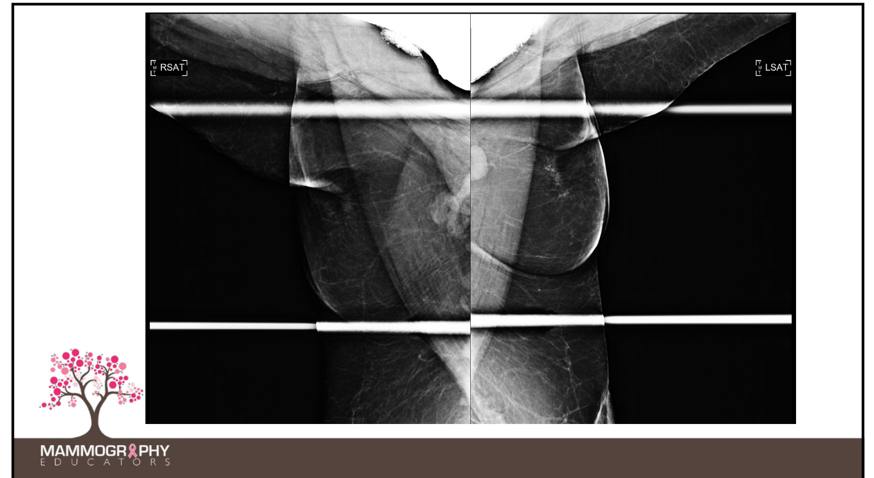

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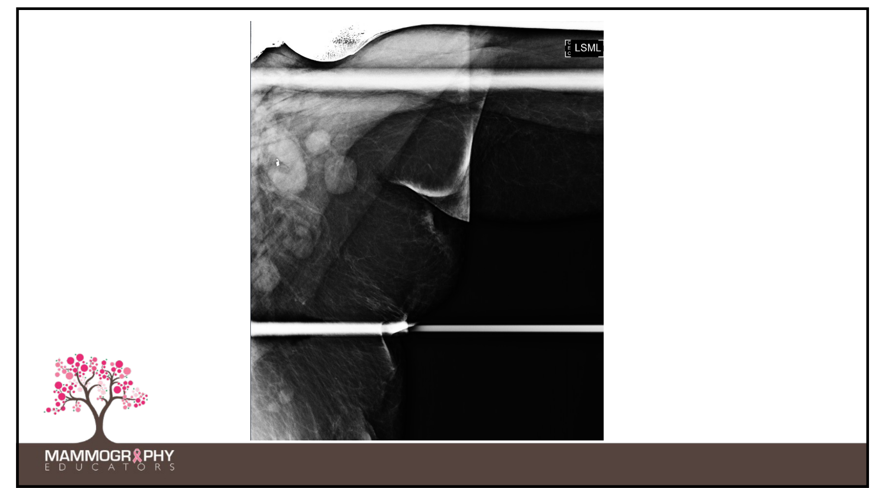

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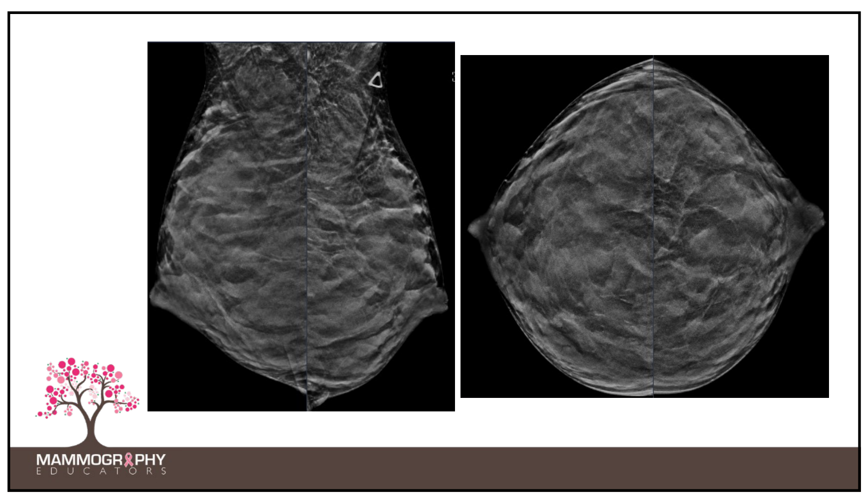

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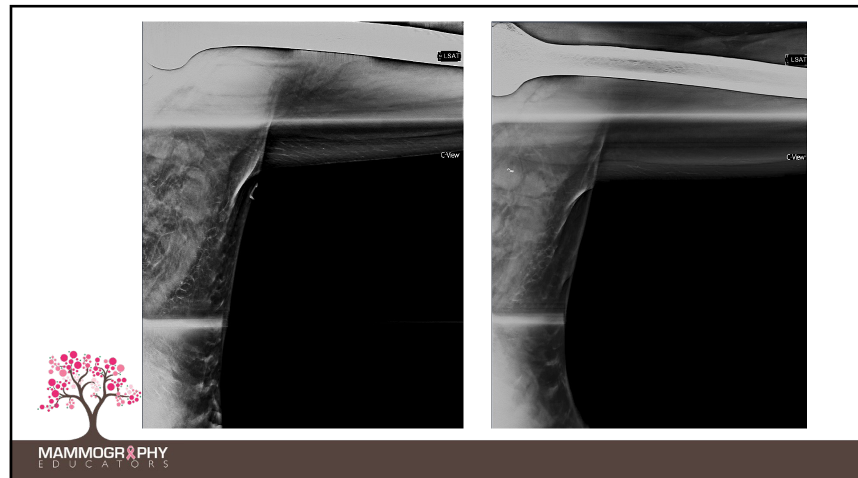

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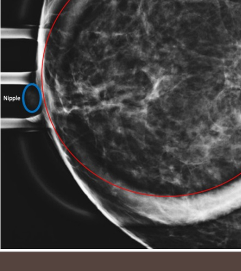
Challenging AOC

Retroareolar lesions:
- Difficult to image due to retraction of the nipple
- Increased discomfort to patient, limiting compression
- Center the round spot paddle offset from the nipple, while the skin line and edge of the paddle should line up.



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Challenging AOC

Spot Compression:
- Technologists are quick to use the “don’t miss” paddle and do not truly understand the difference between the round spot and rectangular paddle
- Encourage communication on paddle preferences
- Maintain consistency among all interpreting physicians

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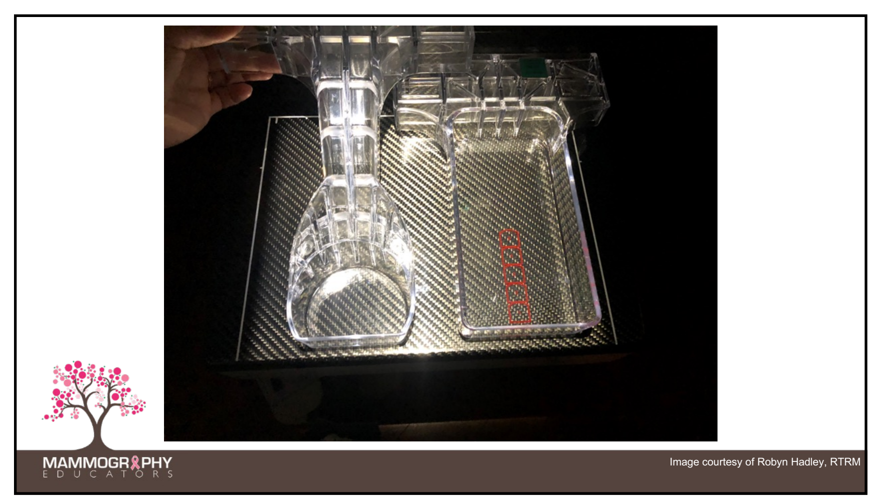

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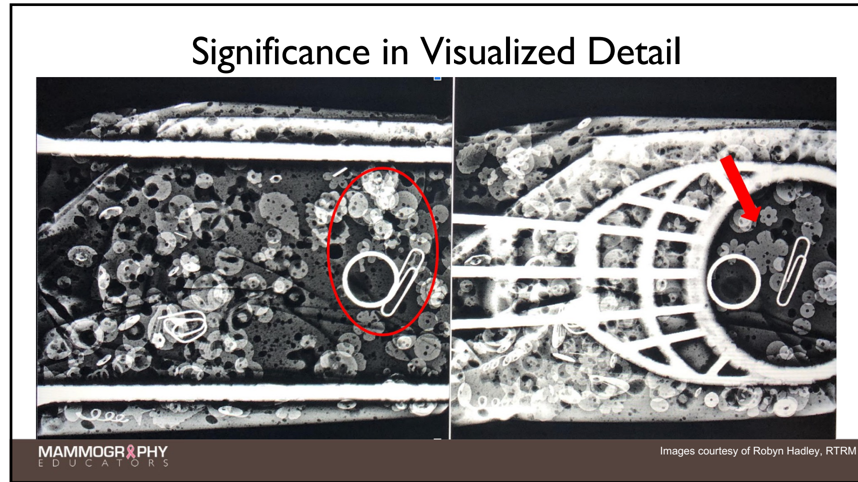

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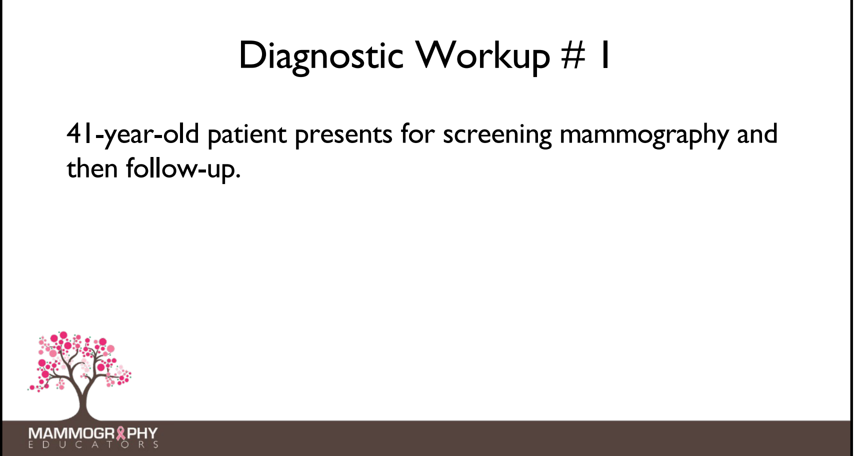

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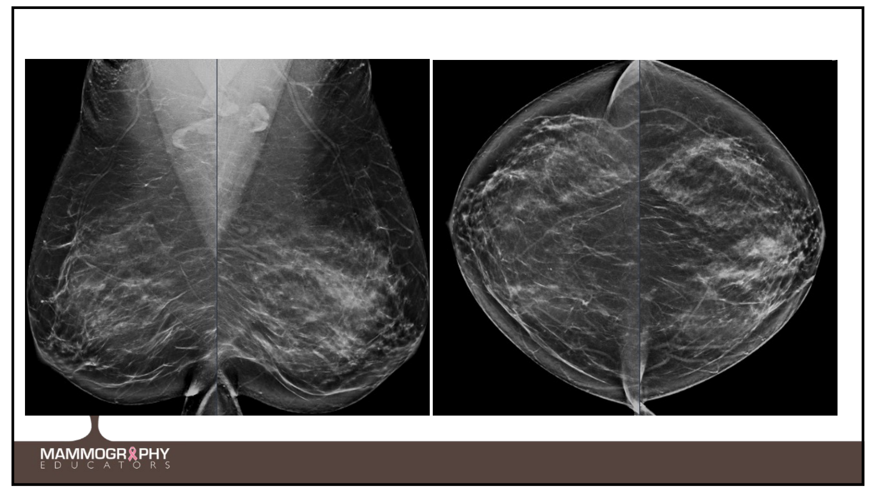

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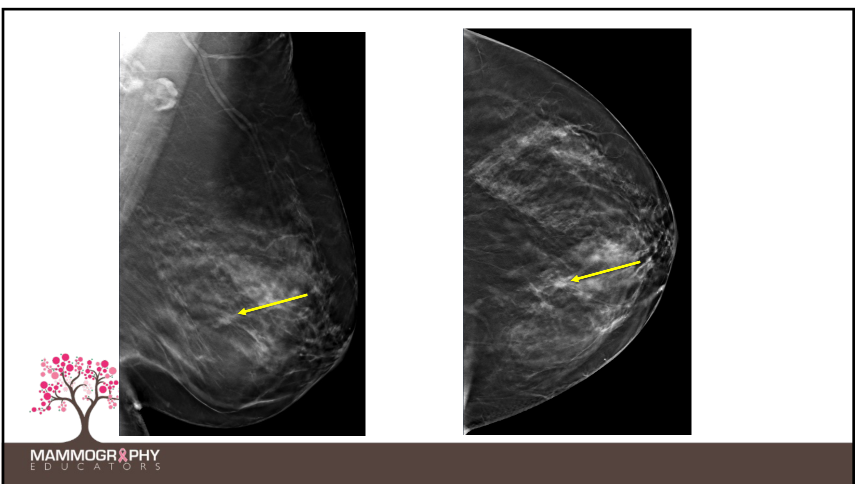

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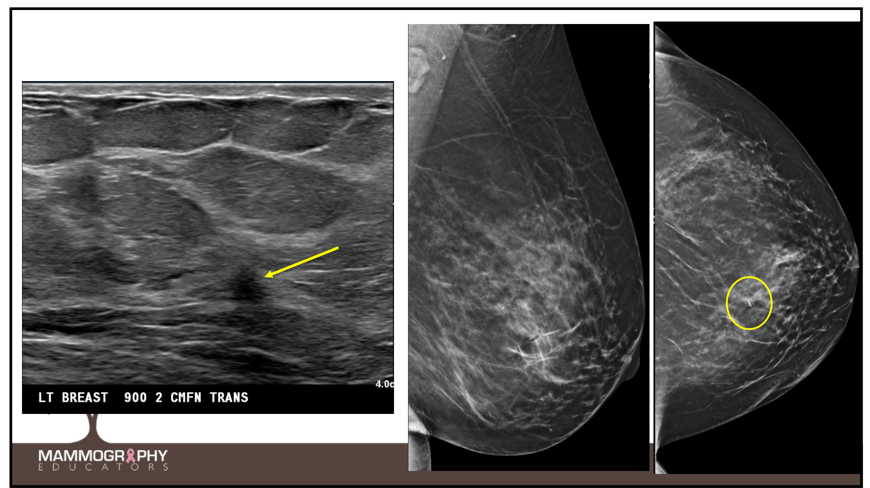

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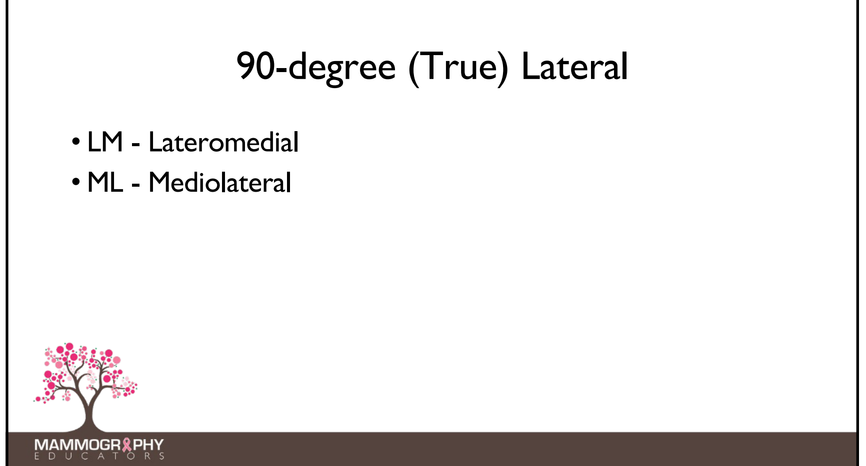

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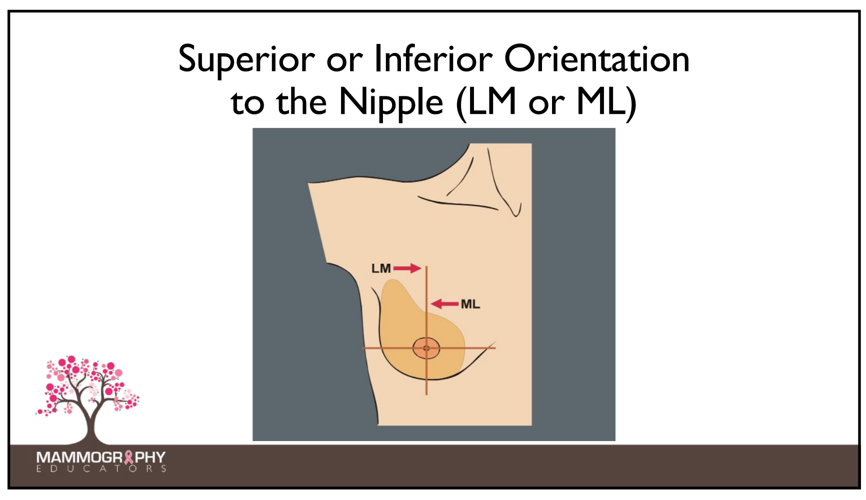
Superior or Inferior Orientation to the Nipple (LM or ML)



Use of the Lateral

- Shows effects of gravity on air fluid levels (Milk of Calcium) now called layering
- Used as a “tie breaker” view (to overcome superimposition of structure)
- Visualizes the breast in the sagittal plane (demonstrates an area of concern superior or inferior to the nipple)

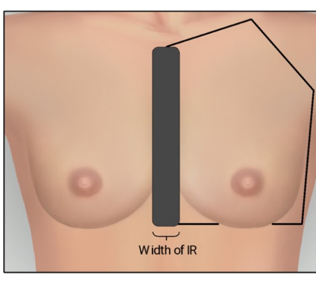
Why do the LM?

- When you did the MLO, you showed the lateral breast in better detail; the LM shows the medial breast in better detail
- The LM takes advantage of the lateral mobile border of the breast and thus facilitates positioning

Why do the LM?

- The posterior medial breast is hardest part of the breast to image and the area most often missed on the MLO
- If done properly, by off-setting the IR into the contralateral breast, you will be able to go deeper against the chest wall
- There is no issue of the contralateral breast impeding the path of the compression paddle

Improperly positioned LM with breasts separated, so the middle of the IR is centered on midsternal line. This excludes deep medial breast tissue on the side you are imaging.



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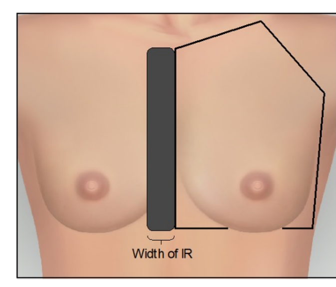
Properly positioned LM with breasts separated so the *top edge of the IR* is centered on midsternal line and the width of the IR pressing against the contralateral breast.



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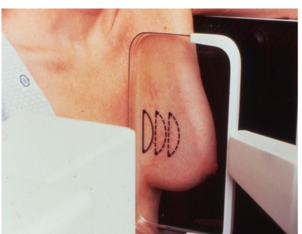
ML – Mediolateral

The opposite breast must be pulled back to allow the compression paddle to pass and may therefore eliminate visualization of deep medial breast tissue.



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Diagnostic Workup # 2

- 32-year-old
- Palpable mass 5-6:00 left breast

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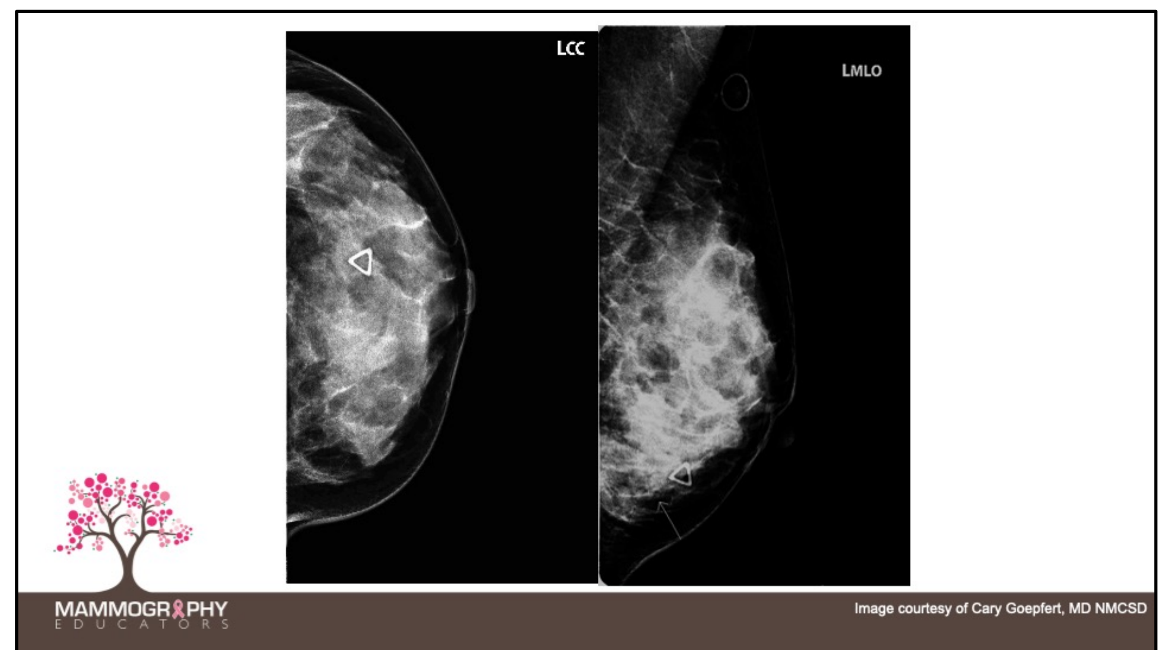
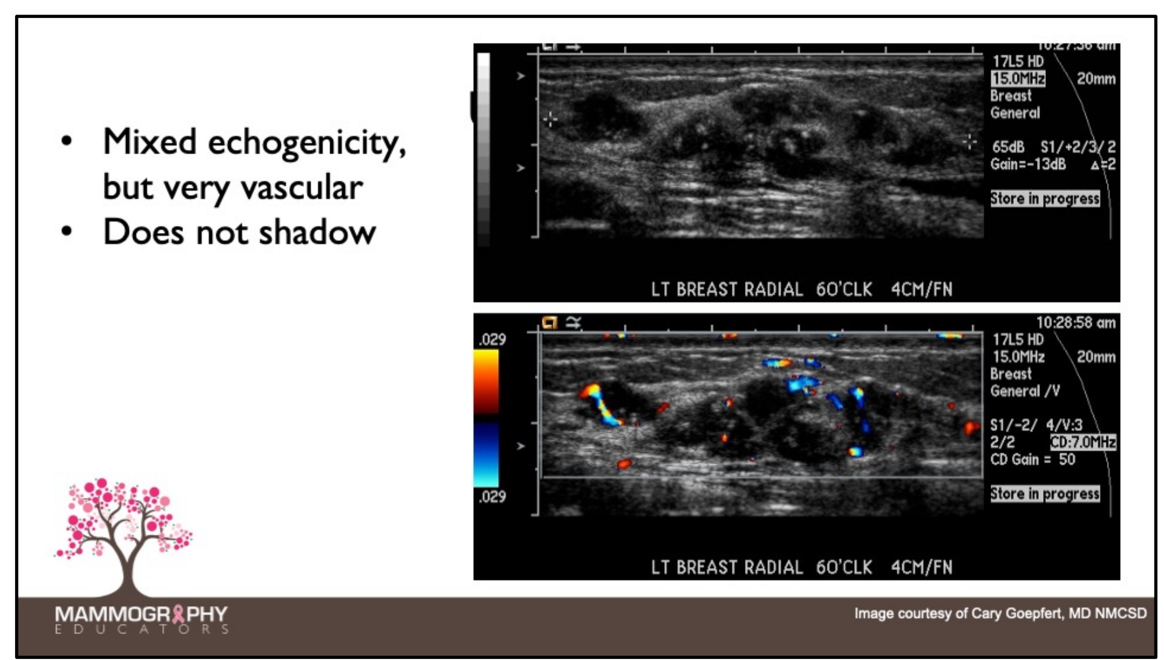
As discussed previously the importance of document: Description, i.e. mass/thickening, location, laterality

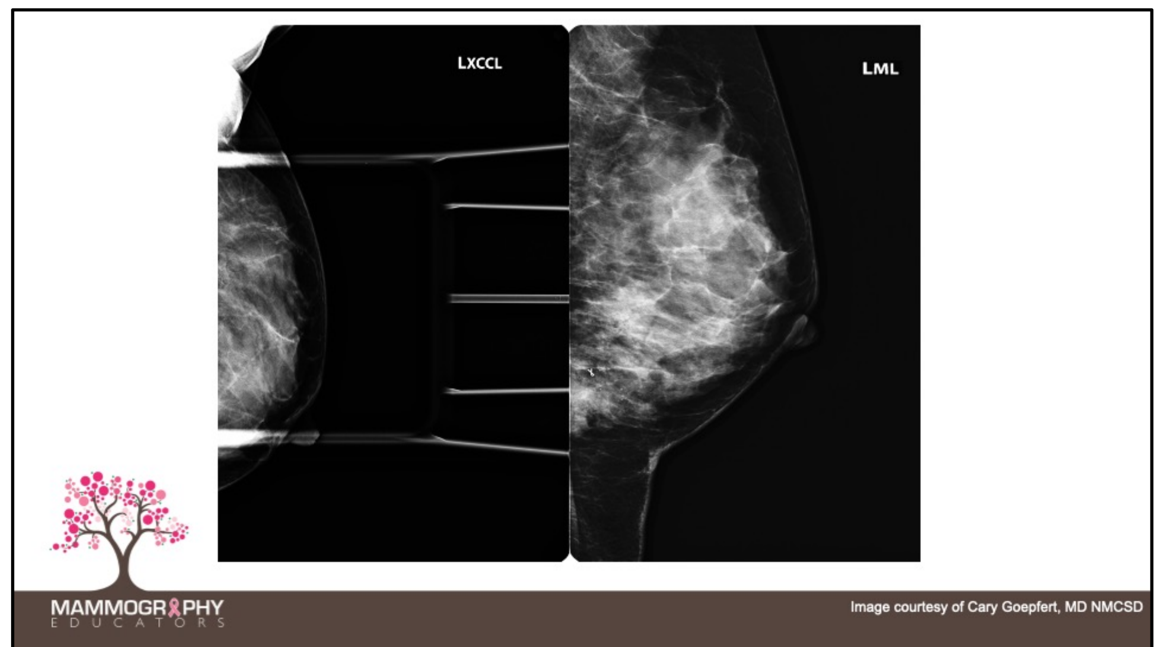


EXTREMELEY DENSE

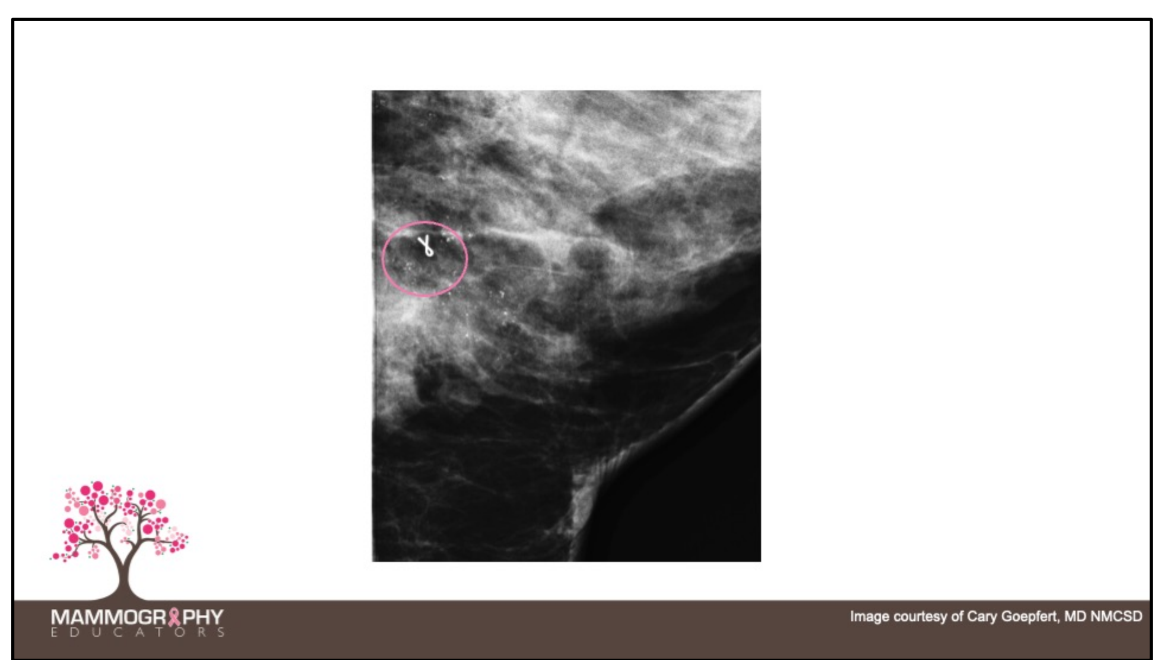
What do you want to see next? Marker indicates mass in central inferior, which corresponds to the 5-6:00 position. Palpable concern always has US, even if no mammographic finding.



Wide, broad area. **CM MARKERS   DISTORTION OF SKIN**

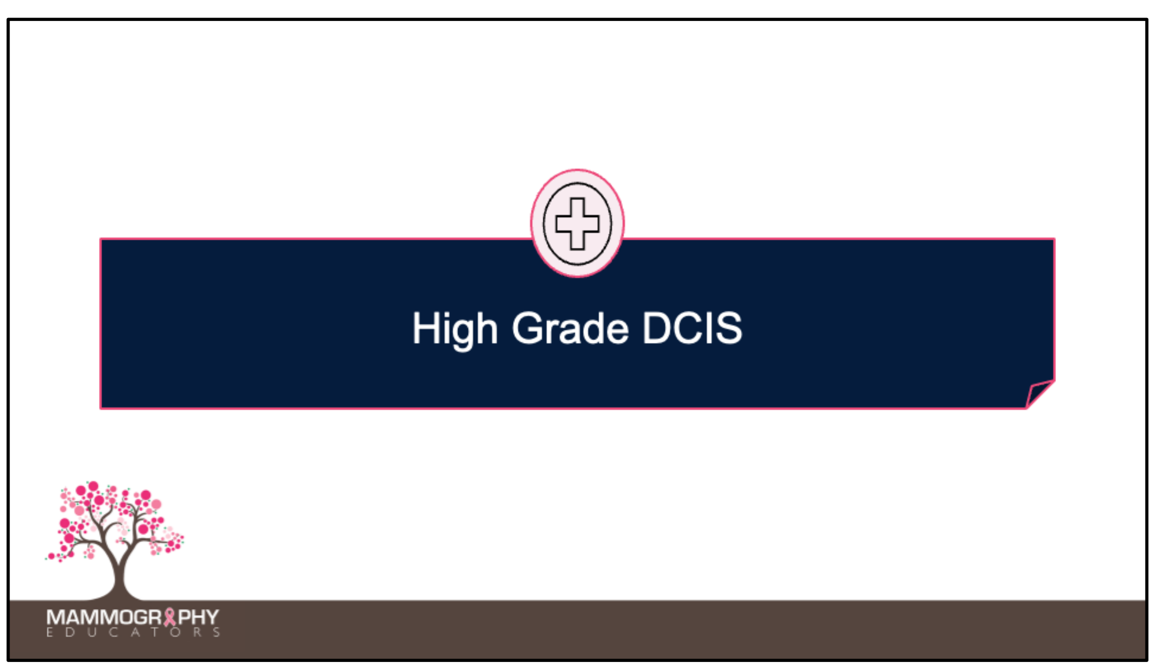


The lateral is actually a post-biopsy image because we can see the tissue marker (next slide).



We can see that there are actually CA++ associated with the palpable finding.

Non mass, clumped linear enhancement DCIS. Kinetic curves are <u>not</u> reliable in evaluation of DCIS; must rely on morphology.
Kinetics: Rely on Angiogenesis and DCIS does not have robust blood supply.



Although DCIS is technically a Stage 0 as it’s still contained within the duct, it has a higher probability of progressing to an invasive cancer than lower grade types (next case).

Diagnostic Workup # 3

- 25-year-old
- One year history of spontaneous right discharge

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- Discharge is thick and yellow
- Mother with premenopausal diagnosis of breast cancer in her 30s
- Diagnostic mammogram ordered

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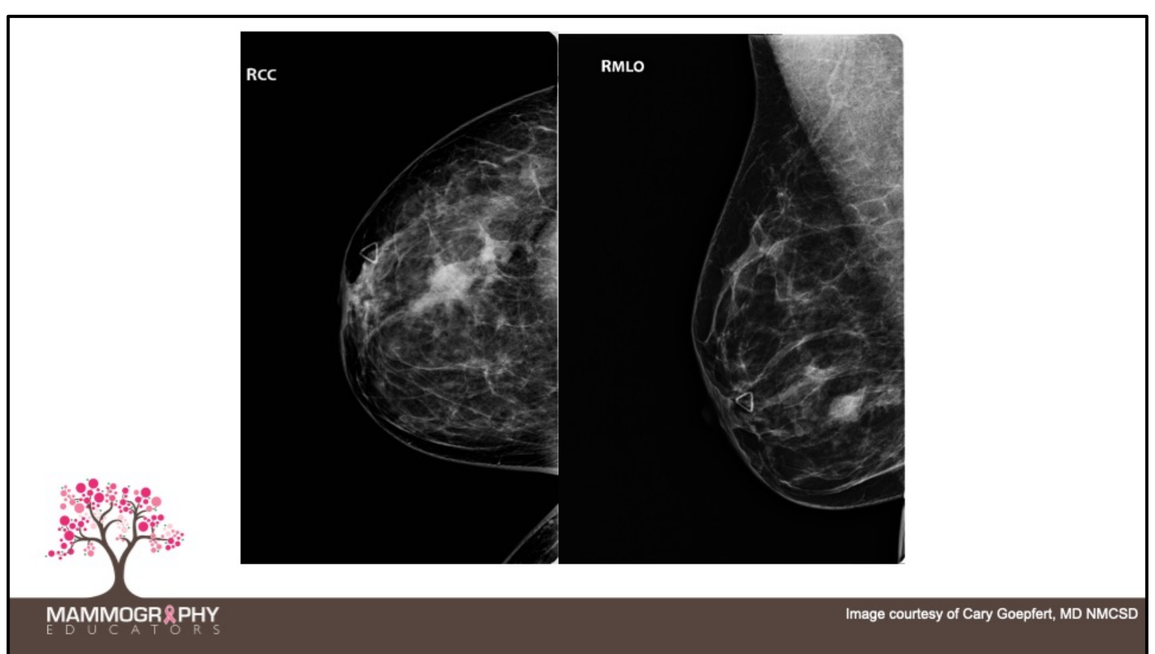
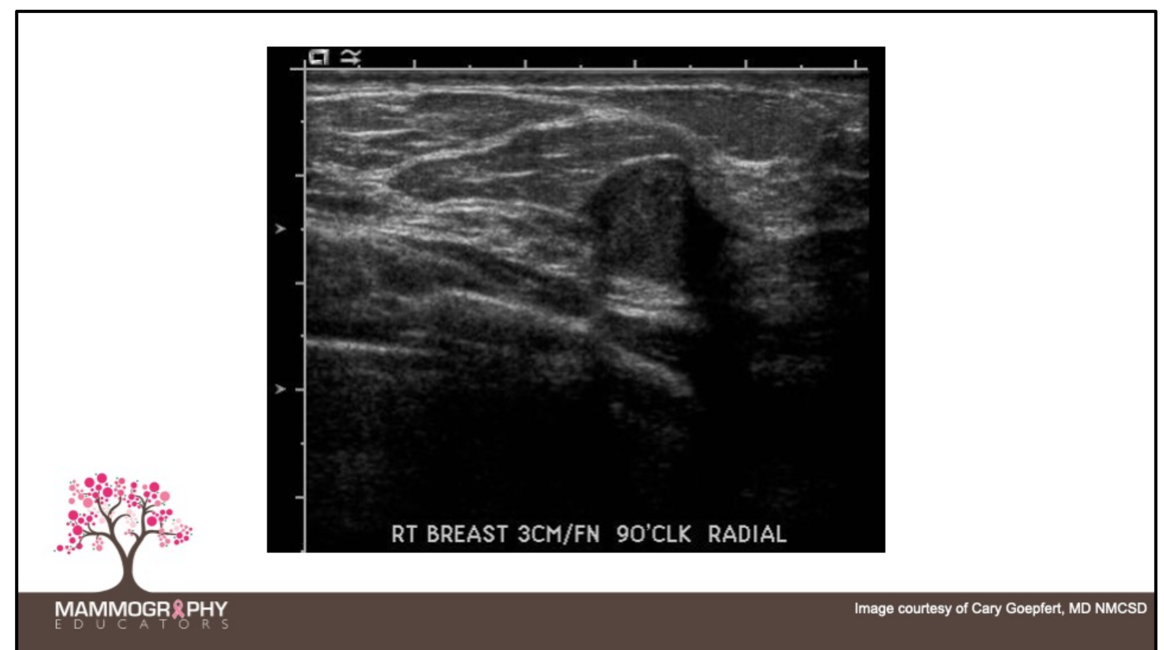
Normal mammo at 30+

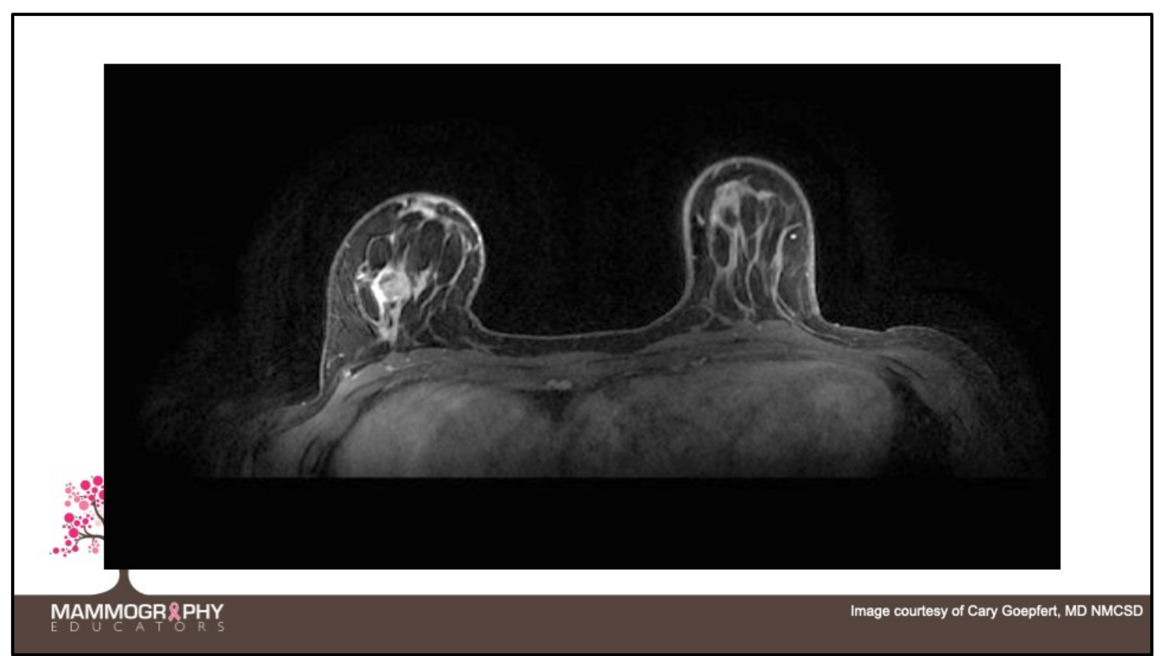
Description of discharge: color, viscosity, spontaneous or expressed



Note palpable marker



Note that this looks like posterior acoustic enhancement or through transmission, but it is not anechoic. This is a “soft” homogenous cancer, which leads to this appearance.



We have seen this appearance before…

This slice is at another level from the prior slide. MRI really helped to delineate true extent of disease with was extensive.

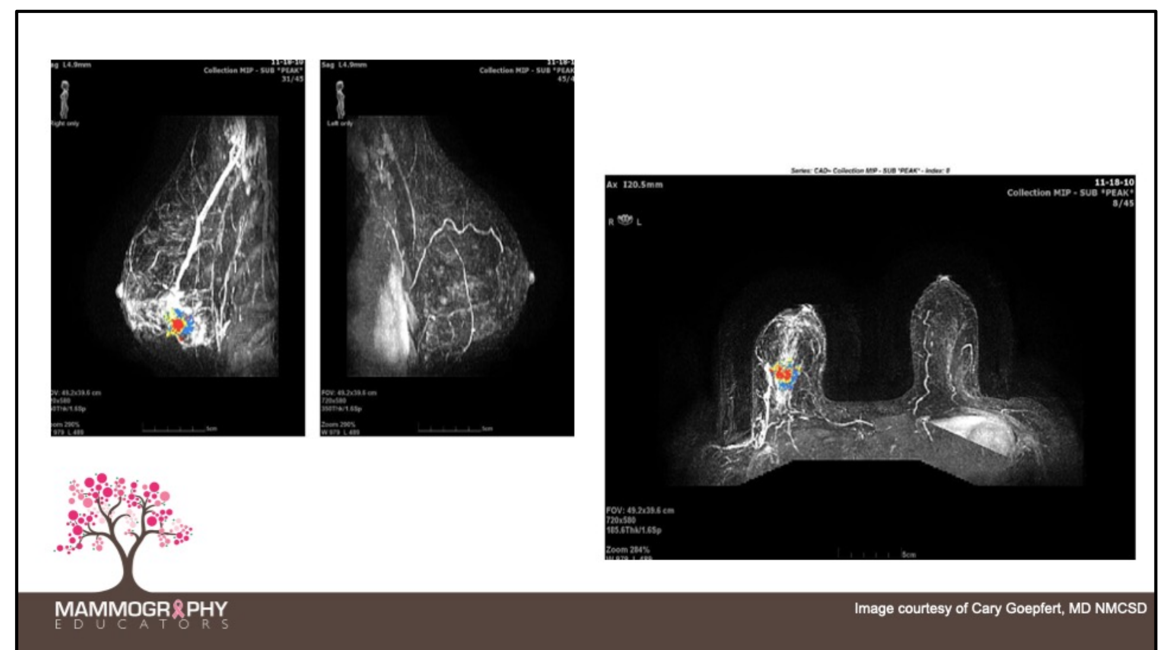

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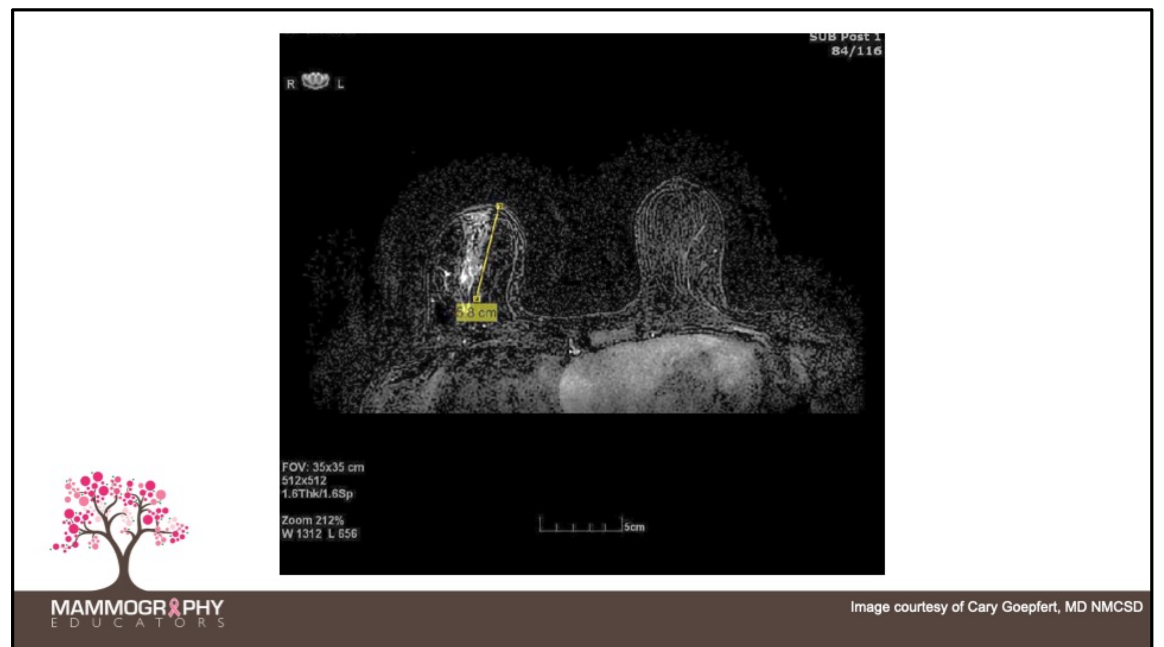
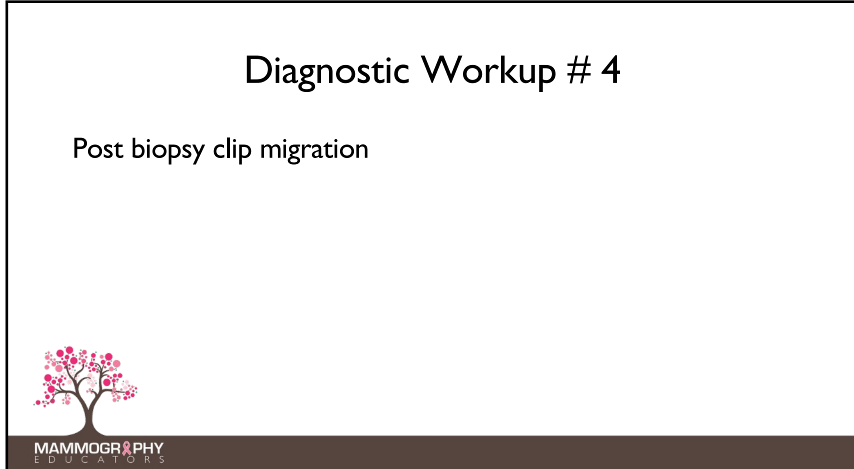
Image courtesy of Cary Goepfert, MD NMCSD



5.8 cm Patient subsequently l tested for BRCA mutation with her young Dx as well as Mom’s and was found to be BRCA1+
Due to BRCA status, had bilateral mastectomy. Appearance due to movement.



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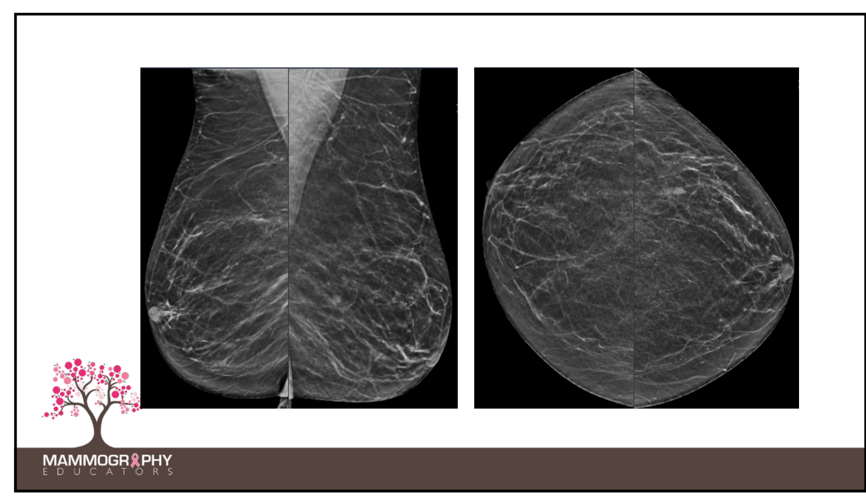

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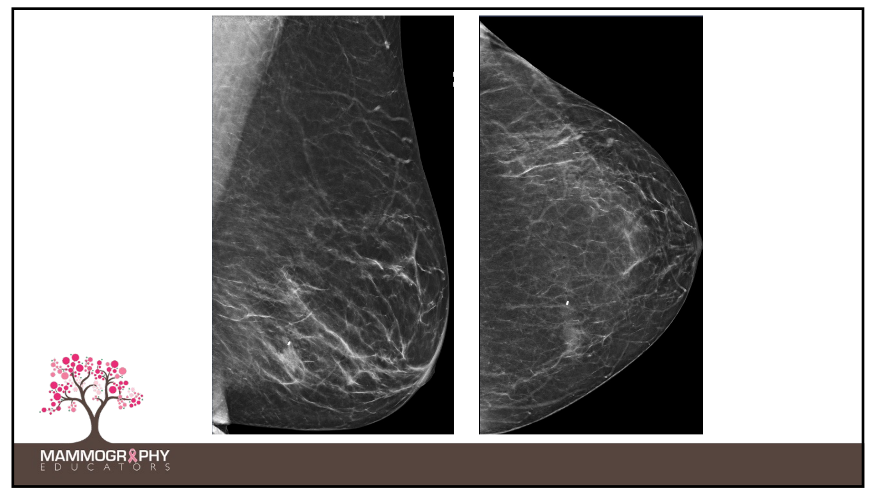

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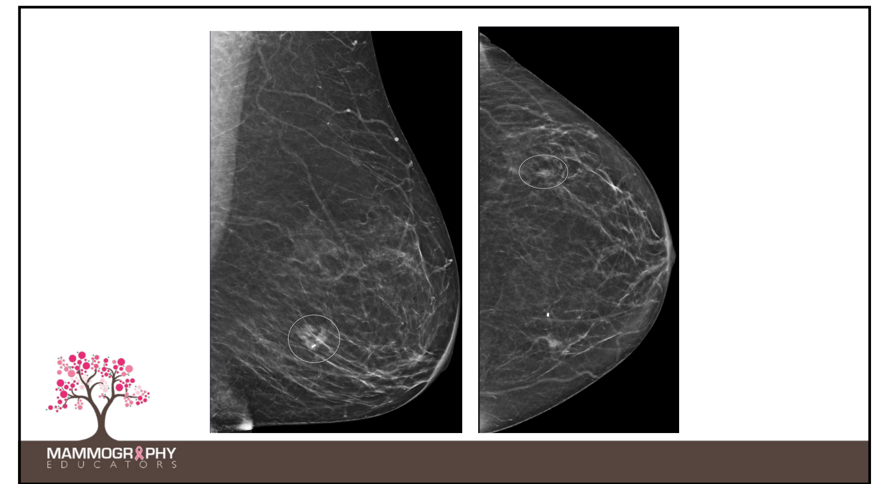

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Diagnostic Workup # 5

Calcifications seen on 1 view only

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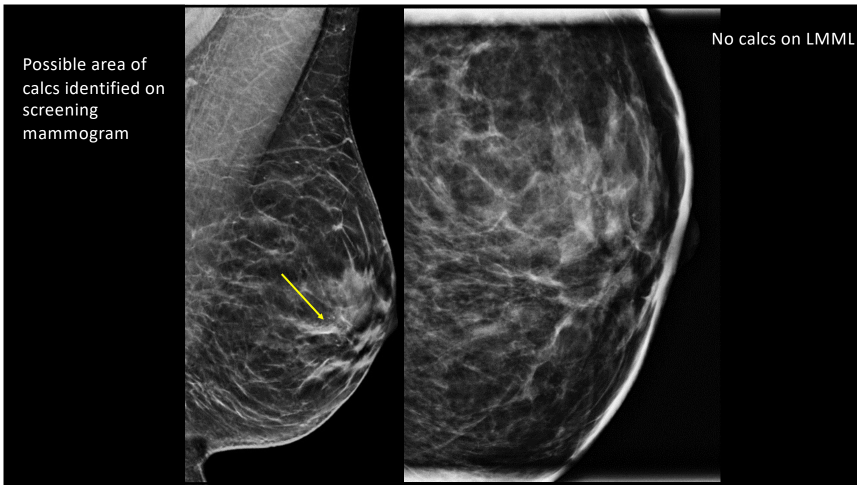

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Conclusion

- Communication between patient and technologist is critical and must use consistent content and terminology.
- That information must be clearly communicated to the radiologists in a clear and concise manner
- A collaborative and collegial relationship is essential in providing the best of care for all our our patients.

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