



Quality in Mammography Where We're At How You Can Help

Audrey L. Hartman, MD MS
Anna K. Chacko, MD

Breast Cancer

- Prevalent
 - 1:8 Lifetime Risk
- Large Market
 - Annual Mammogram age 40
- Litigious
 - High rate of malpractice cases
- U.S. Federally regulated

Quality Initiatives

- Standardization (Inter-Radiologist)
- Outcome: True Positive
- Outcome: False Negative
- Digital Mammography
- Computer Aided Detection
- Double Reads
- External Expert Consultant

Standardization: Mammography Quality Standards Act (MQSA)

- Decrease Inter-Radiologist
Variability of Reports
 - MQSA: Standard Conclusions
 - Birad: Standard Descriptions
- Coding Facilitates Outcomes

MQSA: Standard Dictations

- Birad 1 Negative
- Birad 2 Benign
- Birad 3 Probably Benign
- Birad 4 Suspicious
- Birad 5 Highly Suggestive of Malignancy
- Birad 0 Additional Imaging/Old Films

RIS: Code Report

Enter/Edit MAM Findings

File Options Help

MRN: Name:

Dept. No: DOB: Age:

SSN: Sex:

Chart Loc.:


Comparison:

	Date	Type	Side
1	01/01/2004	OUT	BOTH
2			
3			

No interval changes

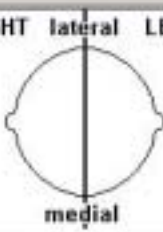
Total Number Reported: 1

	Side	Location	Category	Rec
1	Left		2	N
2				
3				
4				




RIGHT

lateral



medial



LEFT

Enter/Edit Findings

File Help

Side:

Breast composition:

Clockface location/region:

Quadrant:

Depth:

Finding size: mm

Multiple similar findings

Approximate number:

Category / Assessment:

Recommendation No. 121005

Recommendation modifier:

Recall interval: month(s)

Calcification:

Enter/Edit Findings

File Help

Side:

Breast composition:

Ductography Miscellaneous Changes Follow-up of Prior Surgery Current Projections

Mass or Special Case **Calcifications** Associated findings Implant findings Ultrasound

Calcification

Coarse Lucent-centered Amorphous

Dystrophic Punctate Indistinct

Eggshell Round Fine, linear

Rim Skin Fine, linear, branching

Large rod-like Suture Heterogeneous

Milk of calcium Vascular Pleomorphic

Distribution Modifier: Number:

Recommended Projections

1	
2	
3	
4	
5	
6	

Outcome: True Positive Pathology in RIS

Pathology
File Edit Help

MRN: 0000001 Name: JMA GOOD LOCATOR, JR Alias Name: Height:
Dept. No: DOB: 01/06/1980 Age: 24 Years Phone (H): (603) 897-4563 Weight:
SSN: 000-00-0001 Sex: M Phone (W): (800) 692-1121 Ext: More

BxID: 2030 Pathology Date: Pathology Findings (Total Number Reported: 0)

Side:
 Left
 Right

Technique: Stereot
Institution:
Entered By: MORE

Classification of Lesion:
Pathology Report / C

Pathology Findings
File Help

1	ID	Invasive ductal carcinoma
2		
3		
4		
5		

Pathological Size of Tumor: 6 mm Nodes Removed: Nodes Positive: S Phase: %
 Nipple involved

Classification of Lesion: Malignant

Margin Status:
 Uninvolved Involved

Estrogen Receptor:
 Positive Negative

Progesterone Receptor:
 Positive Negative

Histology Grade:
 1 2 3

Stage:
 0 1 2A 2B 3A 3B 4

Save/Clear OK Cancel

Delete New Pathology Review Save/Clear OK Cancel

Outcome: True Positive (MQSA)

- True Positives (Biopsy Rate)
 - $(\# \text{ Cancer}) / (\# \text{ Birad 4-5})$
 - Don't want 1% TP (biopsy all pts)
 - Don't want 100% TP (biopsy known CA)
- Practice Average Data
 - Most Radiologists within 1 STD DEV
- Cancer Rate
 - $(\# \text{ Cancer}) / (1000 \text{ Baseline Mamm's})$

IHE for RIS-Pathology

- Pathology entered manually
 - Tedious
 - Error risk
- Where **YOU** come in:
 - IHE that's NOT vendor specific

Outcome: "Possible" Positive

- Screening Mammogram
 - OK
 - Not OK - Birad 0 (addl imaging)
- Flagged exams, which were cancer?
 - Birad 0 - Pathology correlation
- Where **YOU** come in:
 - RIS modifications, flexibility

What About 'Misses'?

- Positive Cancer
but 'Negative' Mammogram

Outcome: False Negative

- Cancer from All surgical specimens
- Rad recommended biopsy
- Surgeon biopsy on their own
 - Review prior 11 mo mammograms read as 'Negative'
 - Blinded review by 3 Radiologists
- Preliminary results:
No False Negatives

IHE for RIS-Pathology

- Where **YOU** come in
- Automated Pathology input
- Automated RIS reports

Digital Mammography

- Lower radiation dose (40%)
- Fewer 'call backs' for additional views
- Compare to prior mammogram
 - Same institution, different vendor
 - Different institution
 - Print film!

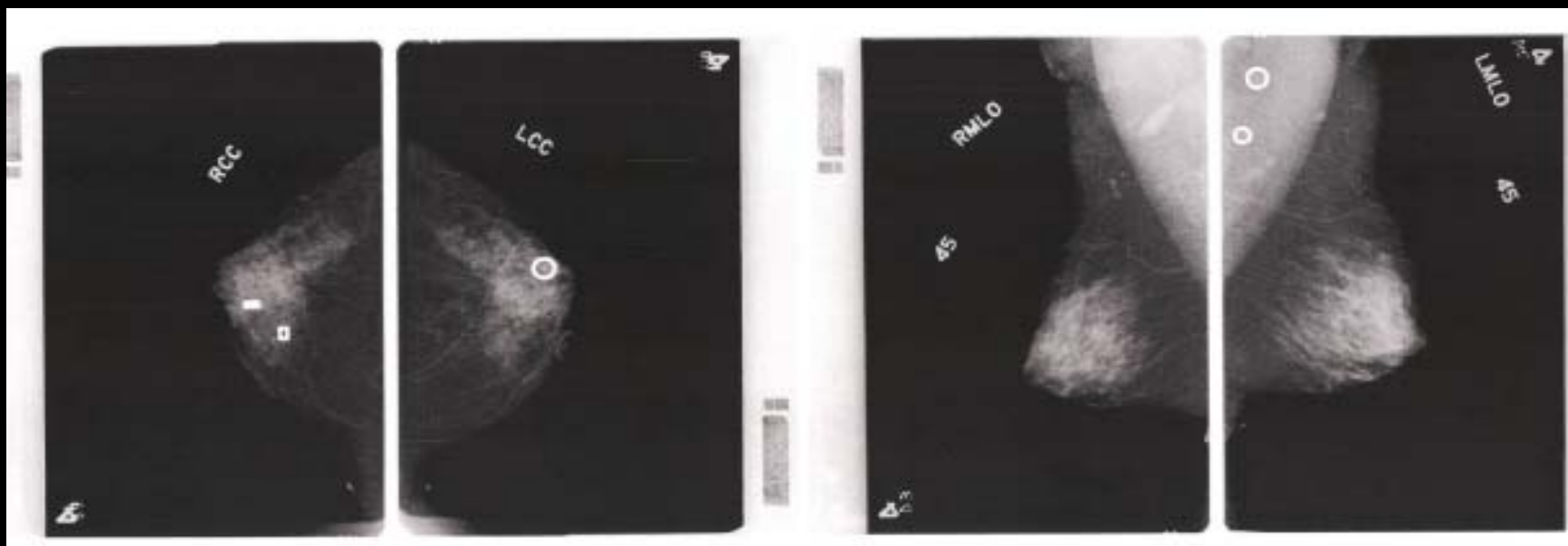
Mammography DICOM

- Where **YOU** come in
- “Not Yet Ready for Prime Time”
 - One vendor reads ALL vendors images
 - Easy upload of other vendor images
 - Diagnostic mammogram within regular PACS

Double Reads

- 2nd Radiologist reviews screening mammogram
- Where **YOU** can help:
 - Flexible RIS to track double reads.

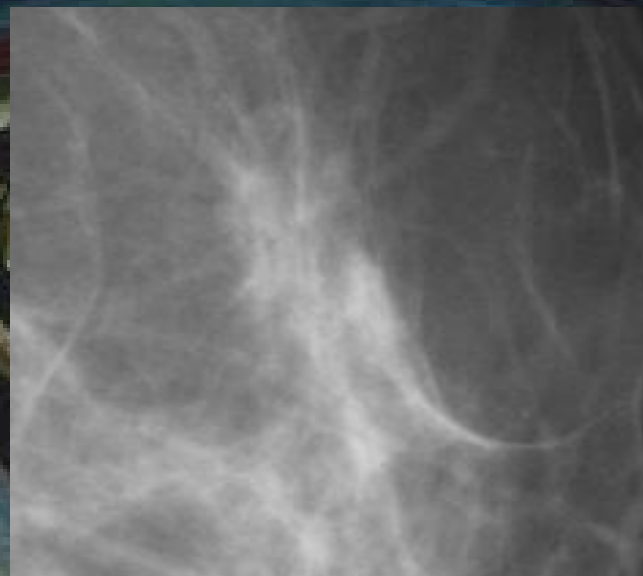
Computer Aided Detection



Computer Aided Detection

- Vendor specific algorithms
 - Microcalcification
 - Mass/asymmetric density
 - Spiculated lesion
- Literature generally positive
 - Increased sensitivity
- Still controversy
 - Increased callbacks

CAD Spiculated Mass



- Algorithm optimization

External Expert Consultant

- Blinded external review
- 40 cases/Radiologist
- Inter-Radiologist Results:
 - Minor discrepancies, up or down
 - No outliers
 - Practice consensus established

External Expert Consultant

- Physical Plant Results
 - Lighting: decrease stray light
 - Alternators preloaded by aide
- Process Results
 - Segregate screening from diagnostic
 - Uninterrupted screening workflow

Quality in Mammography: Our Challenge

- Standardization
- True Positive
- False Negative
- Digital Mamm
- CAD
- Double Reads
- External Consultant

- IHE RIS-Pathology
- RIS flexible
- Digital DICOM
- Algorithm optimization
- RIS modification

In Search of Quality



References

- Mammography Quality Standards Act, 1992
<http://www.fda.gov/CDRH/MAMMOGRAPHY/frmamcom2.html>
- Hermann KP et al Eur Radiol. 2002 Sep;12(9):2188-91. Epub 2002 Apr 18. Magnification mammography: a comparison of full-field digital mammography and screen-film mammography for the detection of simulated small masses and microcalcifications.
- Lewin JM et al. AJR Am J Roentgenol. 2002 Sep;179(3):671-7. Clinical comparison of full-field digital mammography and screen-film mammography for detection of breast cancer.