

Challenges to Delivery of High Quality Mammography

Overview of Current Challenges

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Geographic Access, Equity and Impact on Quality

Tracy Onega, Dartmouth Medical School

Audits and the National Mammography Database

Carl D'Orsi, Emory University

Relevant Questions

How do we ensure broad access to high quality mammography?

What do patients need to understand about new technologies?

How does supplemental screening fit in?

How does the introduction of State laws mandating dense breast notification change expectations, outcome tracking?

Relevant Questions

What does MQSA require with respect to audits?

How does BIRADS address audits?

What tools are used to audit?

What are appropriate audit measures?

How often should audit data be reviewed?

What are reasonable goals for recall rates, detection rates, tumor size/stage?

What are reasonable tradeoffs for sensitivity/specificity?

Overview of Current Challenges

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Disclosures:

Chair, Breast Commission, American College of Radiology

No financial disclosures



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Breast Imaging includes screening and diagnostic mammography, ultrasound, MRI, image guided needle biopsy and other modalities

Expectations are high

Medicolegal implications are an issue

High volume

Variability in interpretation has been a problem

Double reading not feasible

More modalities/procedures can be helpful in patient management, but are time consuming

Who reads mammograms?

There are now more specialists who are dedicated breast imaging radiologists

Digital mammography makes centralized interpretation of screening mammograms feasible; less workable for diagnostic evaluation, where a radiologist should be present

Some groups use general radiologists to interpret screening mammograms or perform diagnostic workups, including breast ultrasound

Almost no non-radiologists, if any at all, interpret mammograms

Individuals who identify themselves as interpreting BI exams or Mammography

Source: ACR

Job	Individuals	ACR members
100% breast imaging	647	491
Spend time doing BI	7212	5208
Spend time doing Mammo	9050	6549
Both BI and Mammo	6835	4966

Mammography has improved

ACR Mammography Accreditation Program & MQSA

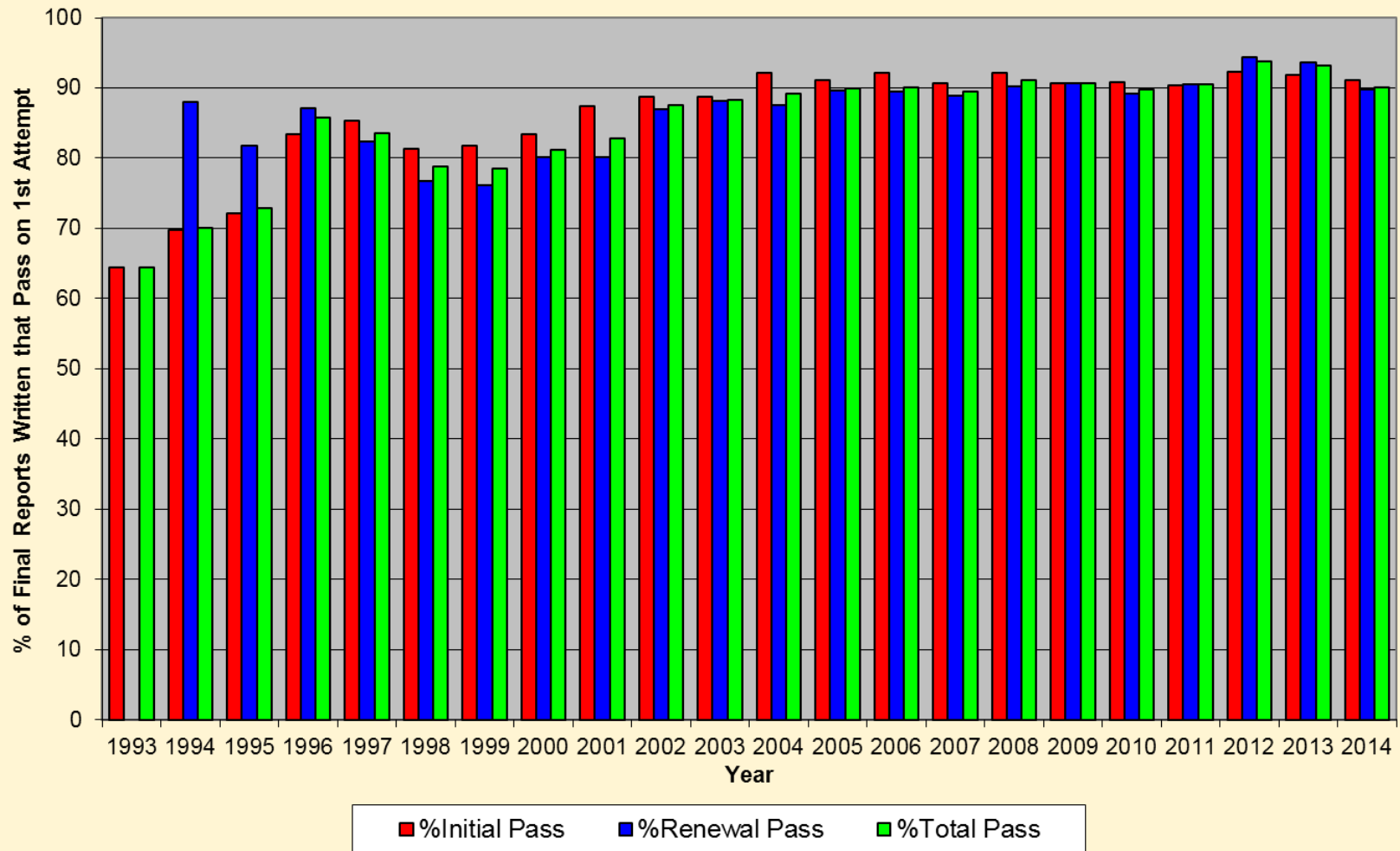
Technologists have learned how to produce better images with good compression and positioning

Digital Mammography: Technique factors less of an issue due to wider recording latitude and elimination of film processors

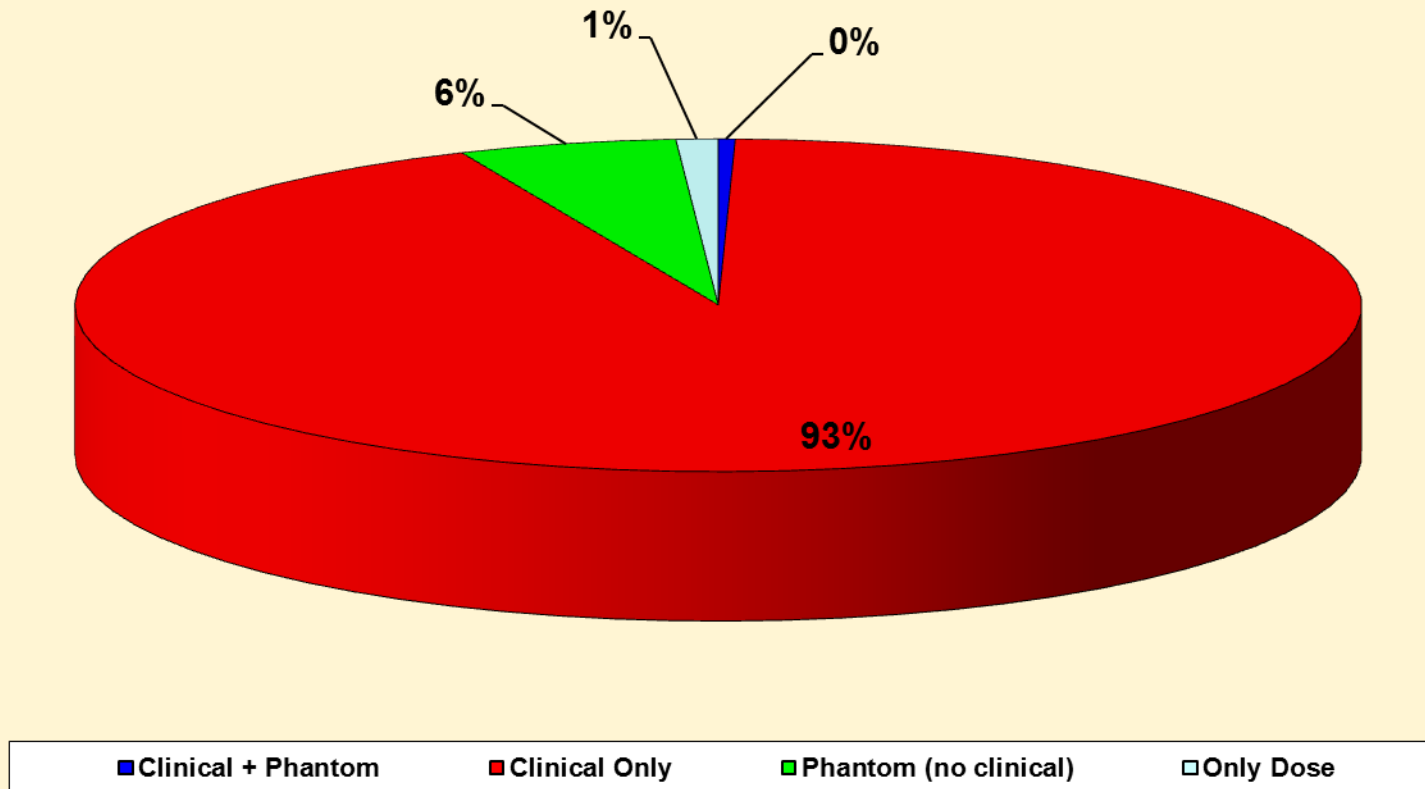
QC easier and more streamlined

Fewer lost exams & ease of transfer

ACR Mammography Accreditation Program Pass Rates



MAP Reasons for Unit Deficiency - 1ST ATTEMPT 2014



When MQSA was reauthorized, a requirement was added re: sending patients a summary in lay terms within 30 days

Communication of Results to Patients

Citation:

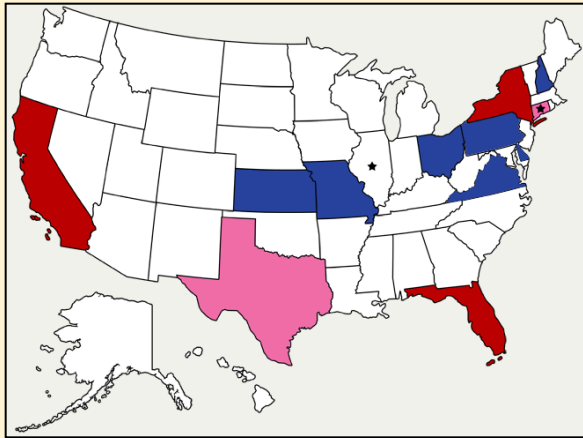
900.12(c)(2)(i),(ii): Communication of mammography results to the patients. Each facility shall send each patient a summary of the mammography report written in lay terms within 30 days of the mammographic examination. If assessments are "Suspicious" or "Highly suggestive of malignancy," the facility shall make reasonable attempts to ensure that the results are communicated to the patient as soon as possible.



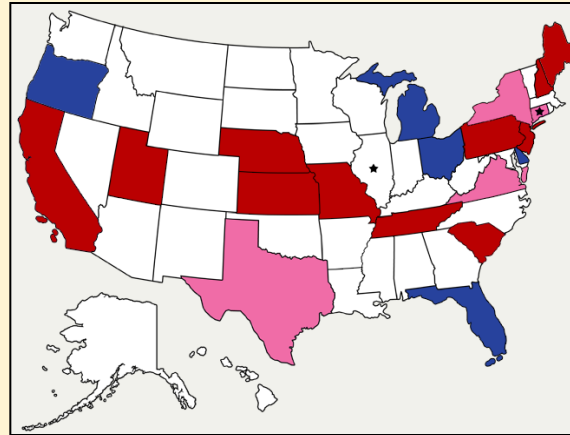
- (i) Patients who do not name a health care provider to receive the mammography report shall be sent the report described in paragraph (c)(1) of this section within 30 days, in addition to the written notification of results in lay terms.*
- (ii) Each facility that accepts patients who do not have a health care provider shall maintain a system for referring such patients to a health care provider when clinically indicated.*



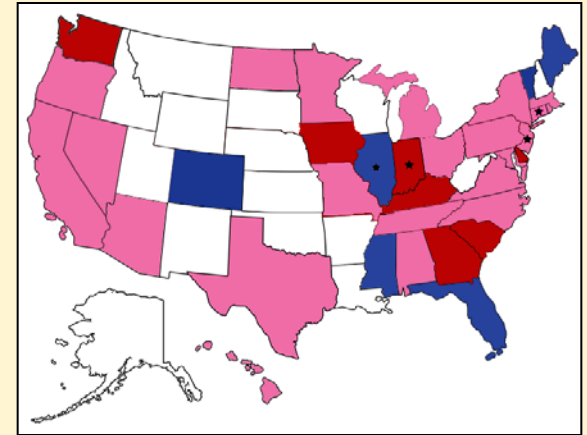
September 2011



September 2012



April 2015



D.E.N.S.E.^R State Efforts



State Dense Breast Legislation Varies

- Type of notification (letter vs poster in breast center)
- Language: Some legislation
 - requires that notification inform whether women have dense breasts; others do not
 - addresses supplemental screening
 - addresses other risk factors
- All say to speak with health care provider
- Few mandate payment for supplemental screening

Requirements for reports & lay letters

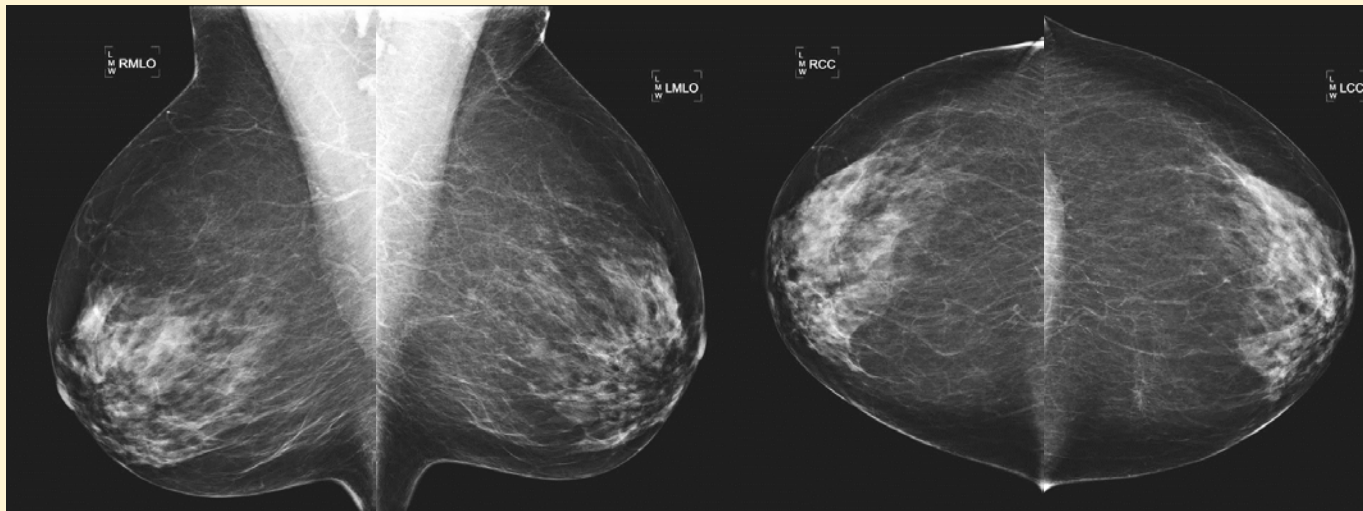
	Lay letter sent	Lay letter density	Report density
FDA	Yes	No	No
BIRADS	Yes	No	Yes

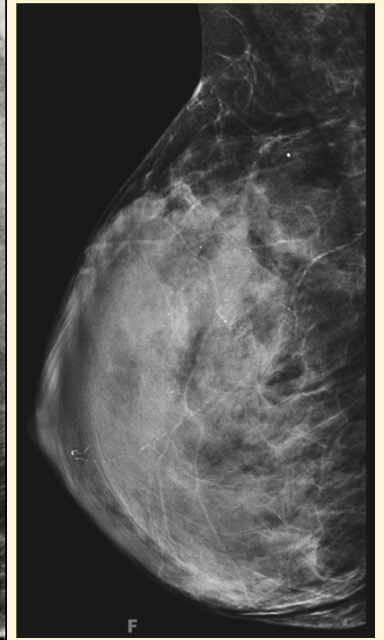
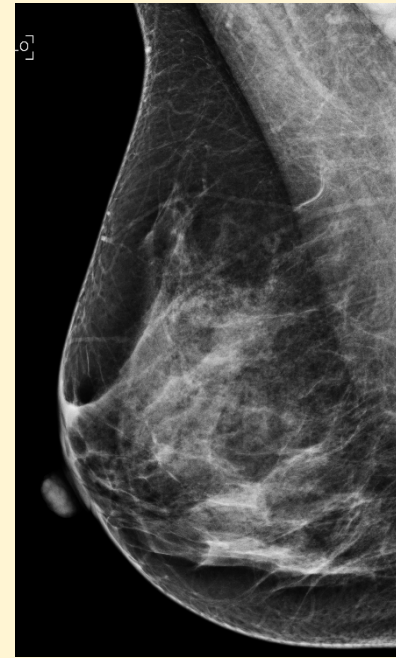
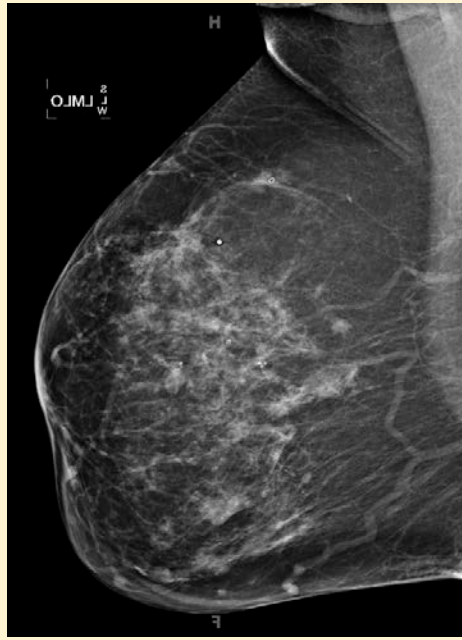
There is no guarantee that a women or her doctor will learn her breast density

What is Mammographic Breast Density?

Relative amount of fibrous and glandular tissue which attenuates x-rays on a mammogram.

Does not correlate with clinical breast examination firmness or lumpiness.





Almost entirely fat
Scattered areas of fibroglandular density
Heterogeneously dense
Extremely dense

**Estimate: women with
dense breasts exceeds
25 million**

Breast Density and Sensitivity Mammography (Film-Screen)

330,000 women from BCSC, 1996-98; 2223 cancers

	Sensitivity %
Fatty	88.2
Scattered	82.1
Hetero	68.9
Extremely	62.2

Carney et al Ann Intern Med. 2003;138(3):168-175

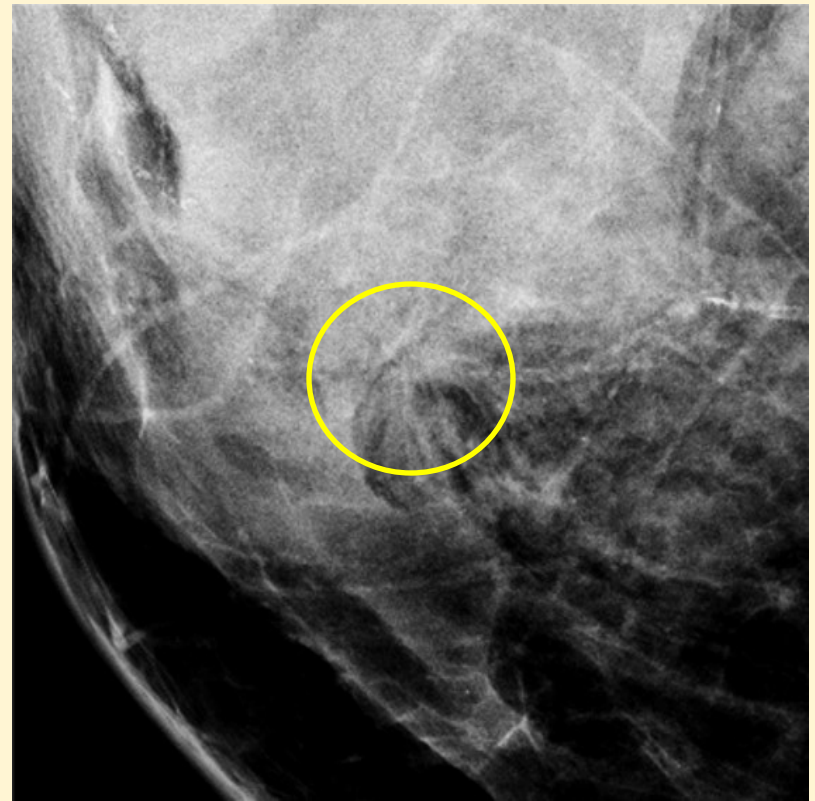
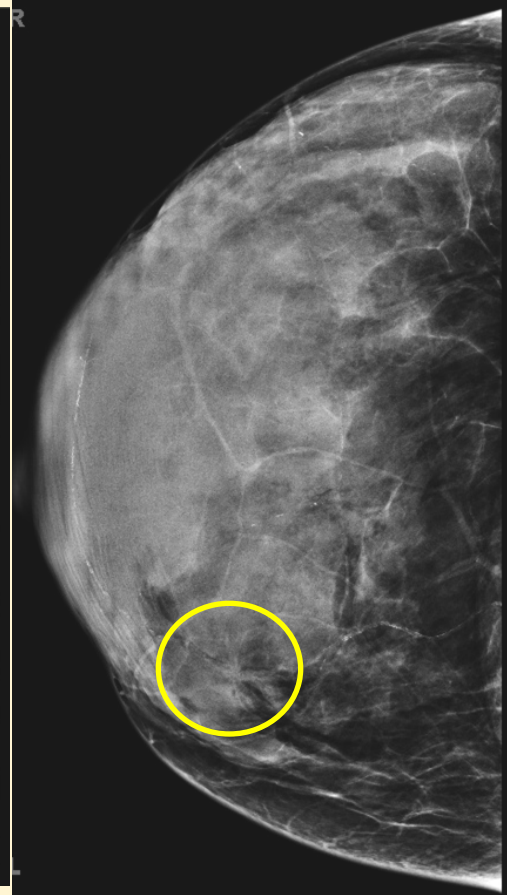
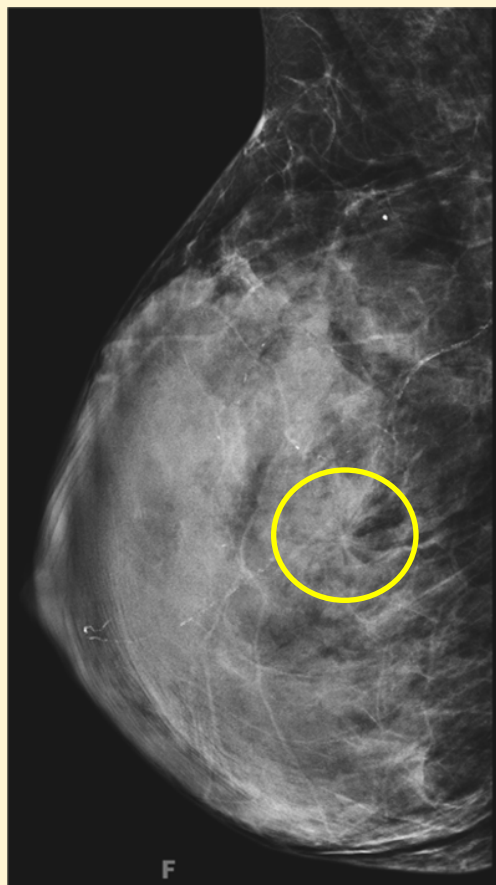
Annals of Internal Medicine
ESTABLISHED IN 1927 BY THE AMERICAN COLLEGE OF PHYSICIANS

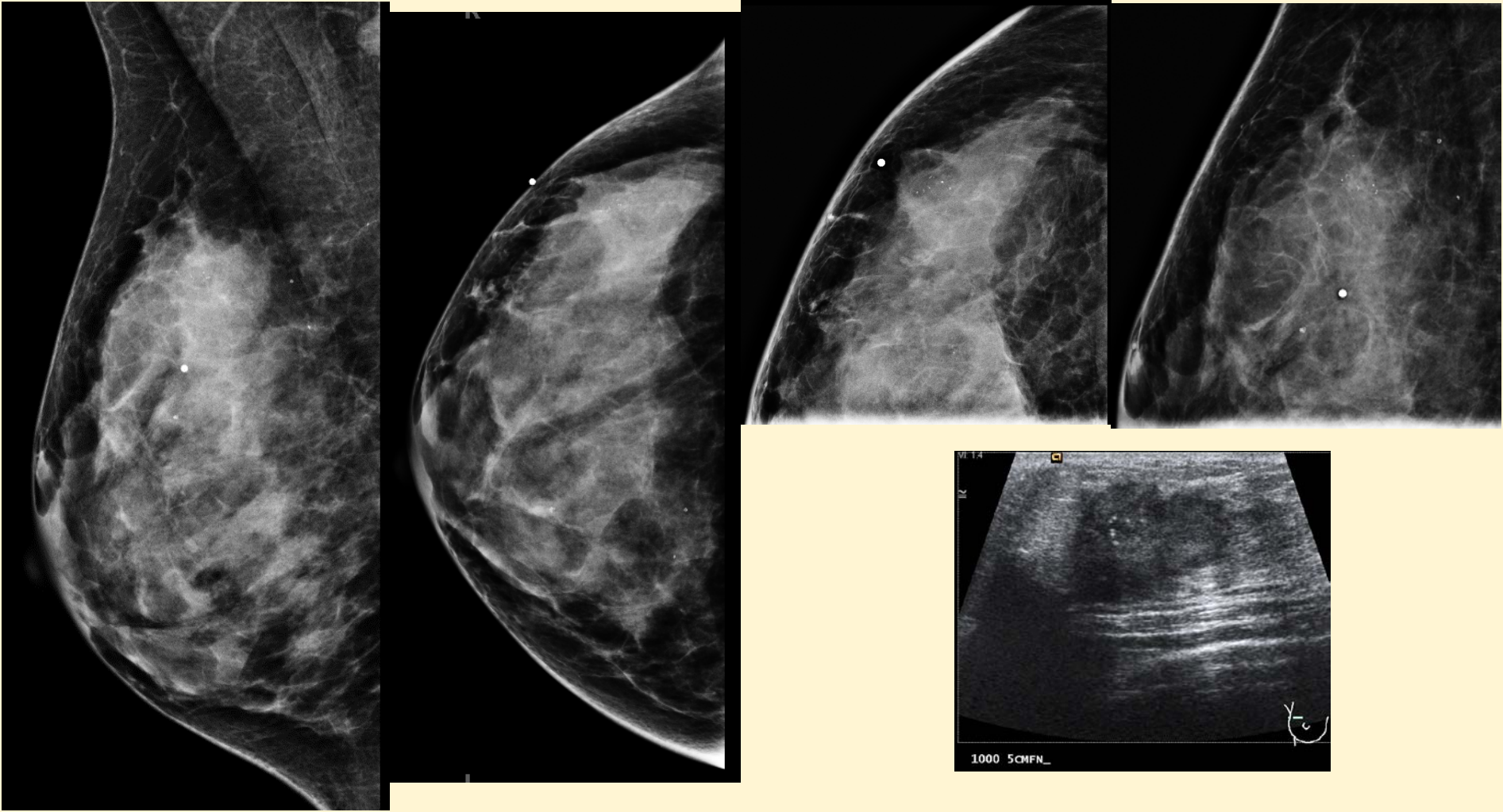
Mammo Sensitivity for Dense Breasts

FFDM vs Film

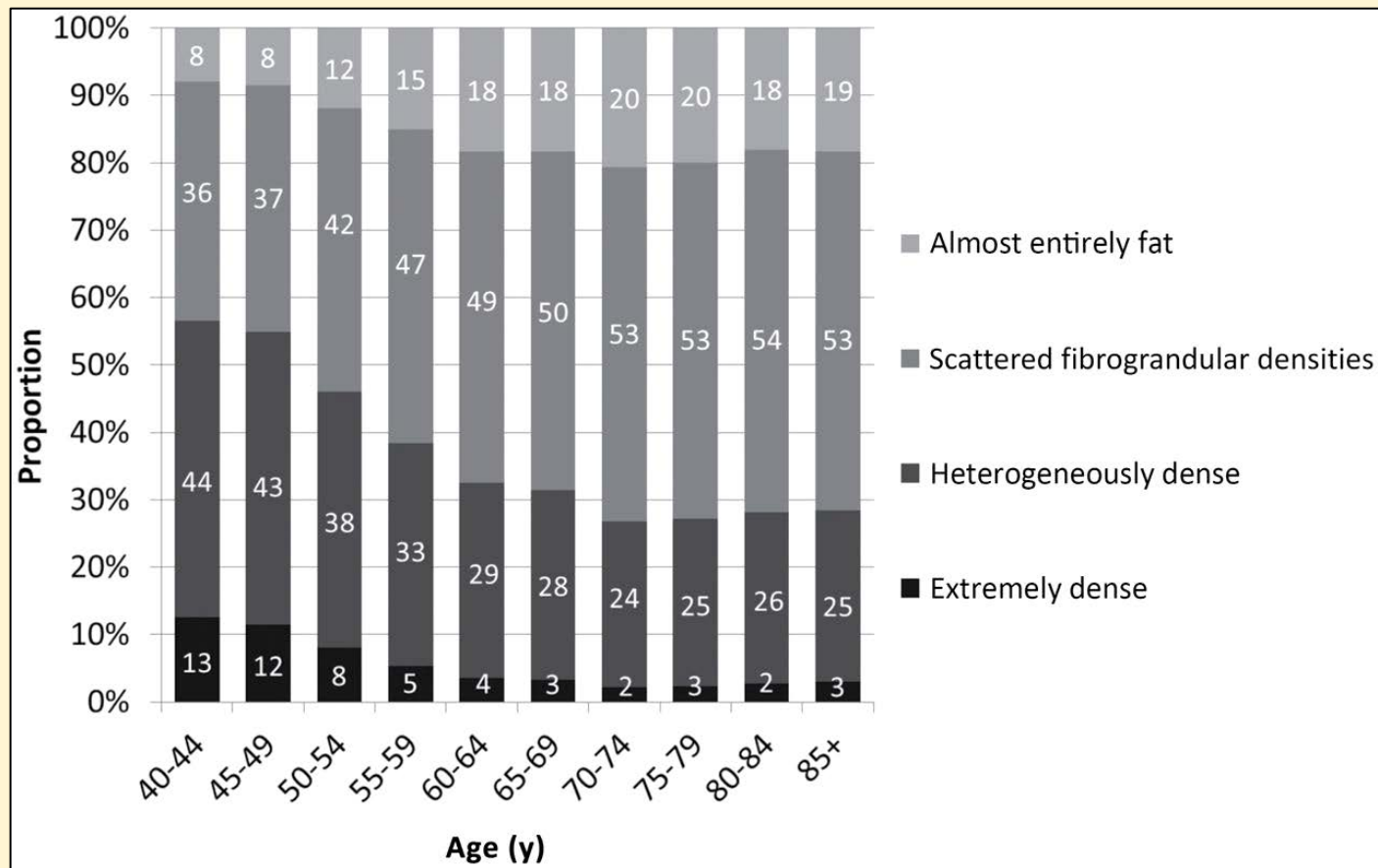
	Film-Screen	FFDM
Hetero	79	82
Extremely	68	84

Kerlikowske et al, Ann Intern Med. 2011; 155: 493-502





Distribution of BI-RADS breast density categories by age, Breast Cancer Surveillance Consortium, 2007–2010.



Brian L. Sprague et al. JNCI J Natl Cancer Inst 2014

JNCI



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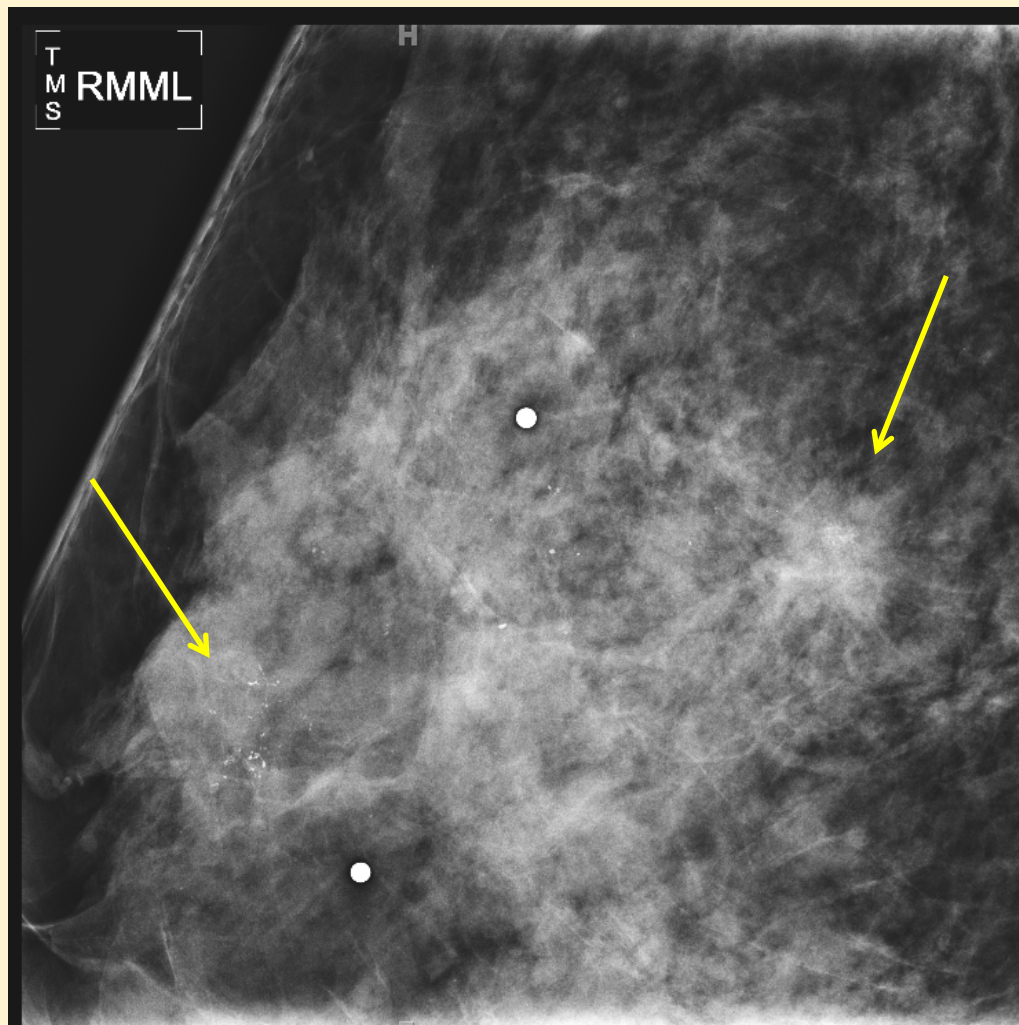
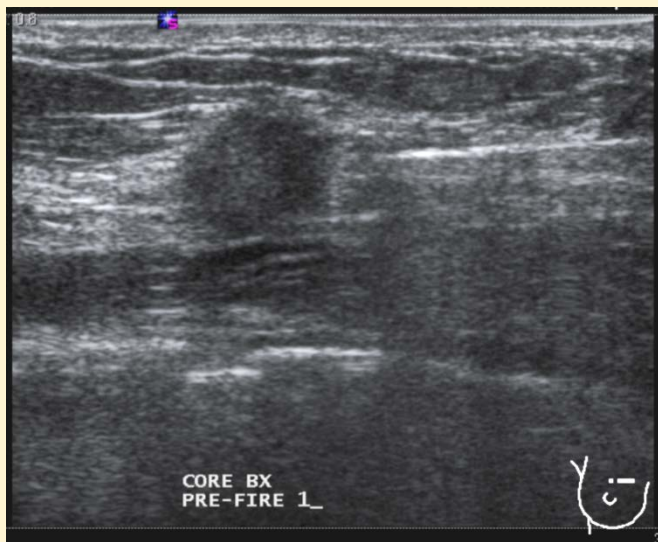
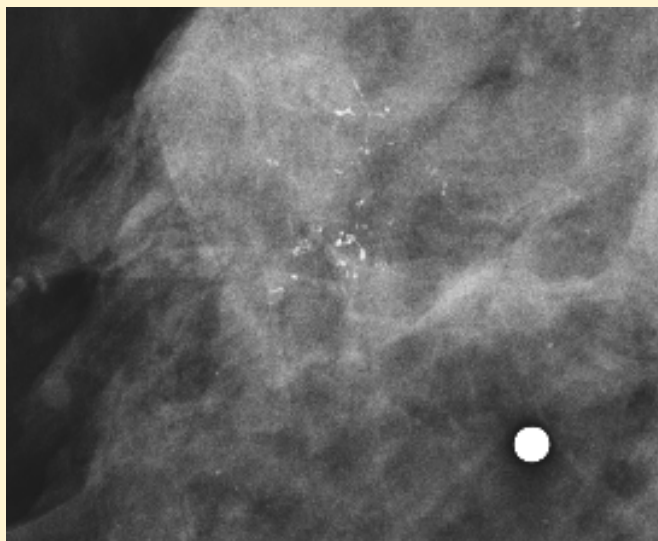
Supplemental screening can detect additional mammographically occult breast cancers



ACRIN 6666

	Prevalence Screen		Incidence Screens	
	Mammo	Mammo +US	Mammo	Mammo +US
Recalls (%)	11.5	26.6	9.4	16.8
Sent to bx (%)	2.4	10.2	2.0	7.0
Cancer yield of bx (%)	29.2	11.4	38.1	16.2
Cancer rate per 1000	7.5	12.8	8.1	11.8
Short term followup (%)	3.2	13.8	1.6	5.3

Berg et al, JAMA 2008; 299 (18): 2151



Published experience from CT shows that additional cancers can be detected by screening US

Hand held, performed by technologists

	Women studied	Incremental Cancer yield/1000
Hooley	935	3.2
Weigert	8647	3.2
Parris	5519	1.8
ACRIN 1 st round		5.3
ACRIN subsequent		3.7

Hooley et al, Radiology, Vol 265; 1, October 2012, p 59

Weigert and Steenbergen, The Breast J; Vol 18; 6, November 2012, p 517

Parris et al, The Breast J, Vol 19; 1, November 2013, p 64



ACRIN 6666:

Adding MRI after 3 annual screens with Mammo & US

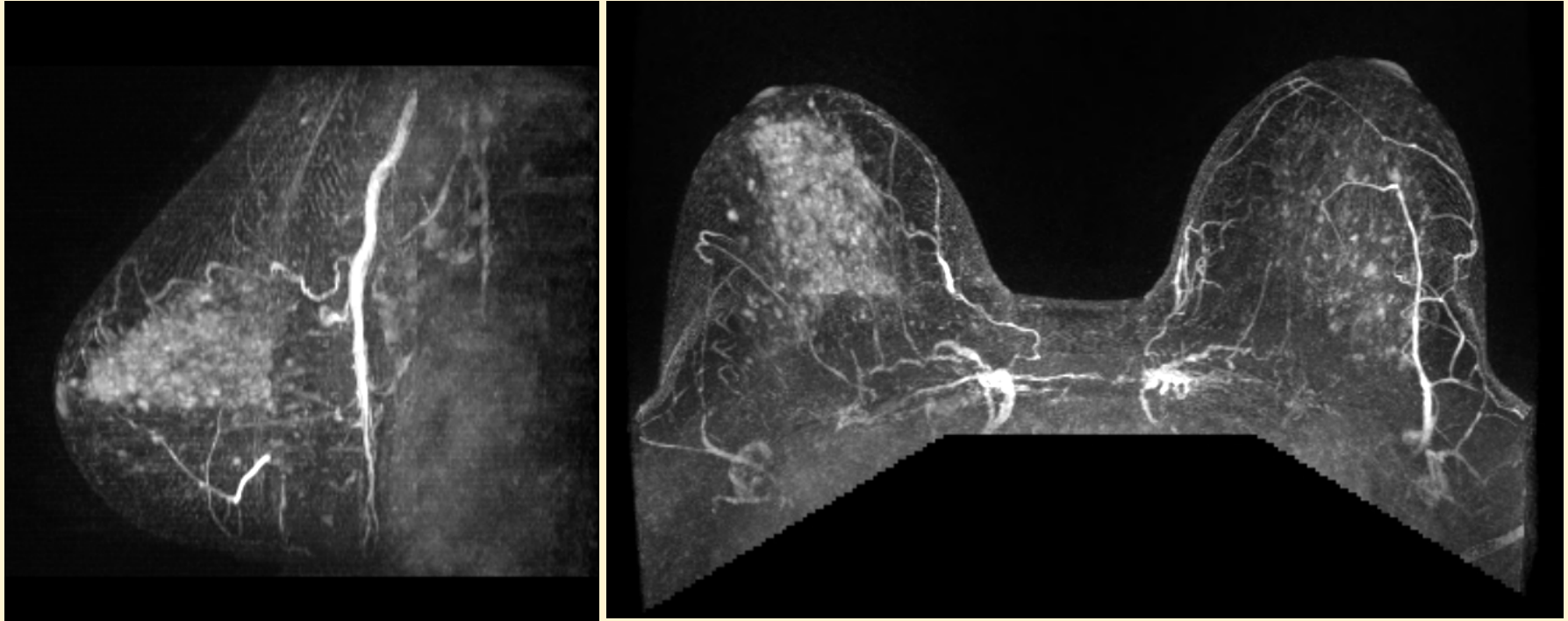
Modalities	AUC
Mammo	0.63
Mammo + US	0.69
Mammo + US + MRI	0.95
Mammo + MRI	0.94

After 3 rounds of screening, 14.7 cancers were detected (per 1000) by MRI in women who had been already screened by Mammo + US.

Berg et al, JAMA 2012; 307 (13): 1394

High risk patient comes for screening MRI

Extremely dense mammogram is normal



Abbreviated Breast MRI... a Novel Approach to Breast Cancer Screening

FAST 3 min breast MRI

Additional cancer yield of 18.2/1000

Kuhl et al, J Clin Oncol 32: 2304

Short-Term Outcomes of Screening Mammography Using Computer-Aided Detection

A Population-Based Study of Medicare Enrollees

Joshua J. Fenton, MD, MPH; Gulbo Xing, PhD; Joann G. Elmore, MD, MPH; Heejung Bang, PhD; Steven L. Chen, MD, MBA; Karen K. Lindfors, MD, MPH; and Laura-Mae Baldwin, MD, MPH

Conclusion: Use of CAD during screening mammography among Medicare enrollees is associated with increased DCIS incidence, the diagnosis of invasive breast cancer at earlier stages, and increased diagnostic testing among women without breast cancer.

Ann Intern Med. 2013;158:580-587



Digital Breast Tomosynthesis (DBT)

Mammography misses approx 20% of breast cancers

Of recalls from screening, 10-20% due to superimposed breast tissue

Lack DBT data on incidence screening rounds

For prevalence screening round:

- DBT increases cancer detection

- DBT reduces recalls for additional evaluation

- DBT improves screening parameters in all but fatty breasts

	Design	Increase CDR	Decrease recalls
Ciatto	Prospective; paired	51%	17%
Skaane	Prospective; paired	27%	15%
Rose	Retrospective; non-paired	54%	34%
Haas	Retrospective; non-paired	10%	30%
Freidewald	Retrospective; non-paired	41%	15%
Durand	Retrospective; non-paired	4%	37%



Thoughts:

Mammography quality has improved and advances such as DBT can improve screening parameters

There are limitations to mammography and complementary technologies can improve cancer detection

Who should have supplementary screening and with what methods?

The workforce is not standardized and varies in practice settings