



Risk based breast cancer screening

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Objectives



- Briefly discuss **screening guidelines**
- Describe **risk-based** approach to breast cancer screening
- Review current **imaging modalities & breast density**



Disclosures

- Contributed to **ACOG Evidence Review Panel** on Early Onset Breast Cancer
 - (creating online CME modules on EOBC – production in progress)



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

Screening Guidelines

- Old paradigm:
 - *Mammogram every year for every woman*
- New paradigm:
 - *“... the recommendations on when to get a mammogram... seem to fluctuate between every 5 years and every five minutes”*

Gail Collins, *Medicine on the Move*. New York Times April 2011.



Who has an
opinion?

USPSTF

ACOG

American Cancer Society

National Comprehensive Cancer Network

American College of Radiology



Society	Year	Clinical Breast Exam	Start	Stop	Interval
USPSTF	2009	Insufficient evidence to recommend for or against	50, ok to consider at 40	75	Biennial
ACOG	2017	Offer	40 (offer, SDM) 50 (start)	75	Annual or Biennial
ACS	2015	Recommend against	40 (offer, SDM) 45 (start)	Life expect <10 years	40-54 annual 55+ Biennial (annual OK)
NCCN	2018	Recommend yearly	40	No recommendation	Annual
ACR	2017	No recommendation	40	No recommendation	Annual

Shared Decision making

Shared decision-making is a key component of patient centered health care

Eliciting patient beliefs and values is important

Patient-centered health care decisions

Barriers to communications

time constraints

lack of knowledge

low health literacy

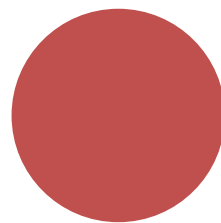
language barriers

desire for personalization

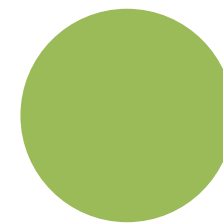
autonomy



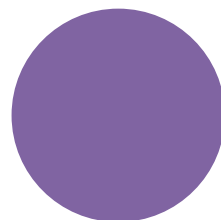
Pay
attention
to



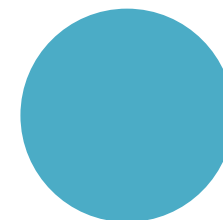
FAMILY
HISTORY



PRIOR HISTORY
OF BIOPSY



RACE /
ETHNICITY



DENSITY

To evaluate for average / medium / high risk populations

Who needs a **genetics referral?**

NCCN guidelines

Version 3.2019, January 2019

- **1st or 2nd degree relative with:**
 - **Known mutation**
 - **Two relatives with Breast ca on same side, one dx'ed <50**
 - **One breast cancer dx'ed <45**
- **Male Breast cancer**
- Two or more primary cancers in one individual (bilateral breast =2)
- Pancreatic cancer
- Ovarian Cancer (any age)
- Metastatic prostate cancer

Breast Cancer Risk Assessment Tool (Modified Gail Model)

Tyrer-Cuzick ——— Claus Model ——— BCSC

Gail Model	Inclusive Items	Limitations for Early Onset Breast Cancer
<ul style="list-style-type: none"> • 5 year breast cancer risk • Lifetime breast cancer risk (to age 90) 	<ul style="list-style-type: none"> • Age • First degree female relatives with breast cancer • Ethnicity/Race • Age at menarche • Age at first birth • Prior breast biopsies (and if atypia present) 	<ul style="list-style-type: none"> • Not validated prior to age 35 • Ignores all breast cancer except female first degree relatives • Does not include any potential related cancers (e.g., ovarian) • Cannot use in women with prior DCIS, LCIS, or thoracic radiation.

Who is **average risk**?

- **Lifetime risk 12%**
 - No first-degree relatives
 - No genetic mutation
 - No prior abnormal biopsy
 - No chest radiation therapy

Average or low risk women

Mammography starting at 40-50 every 1-2 years

CBE can consider during annual

Breast Awareness sure!

SBE no

Who would be **intermediate risk**?

- **Lifetime risk >12 and <20%**
- + family history but gene negative or declined genetic testing
- Hx atypical lesions LCIS, ADH, ALH
- dense breasts, AA or AJ women

Intermediate risk

Annual (3D) Mammography at 40-45

CBE Do during annual

Breast Awareness YES!

SBE If they want to

Genetic Counseling ?

Some providers consider annual screening ultrasound or MRI
(no evidence to support yet)

Who is **highest risk**?

- **Lifetime risk >20-25%**
- BRCA1 or BRCA2 (+)
- Untested but first-degree relative BRCA+
- Chest radiation
- Other known hereditary syndromes

Highest risk (>20% lifetime)

Annual mammography

Start time variable (30 years)

Annual MRI and CBE

Genetic Counseling

Surgery or chemoprevention

Race/ethnicity as risk assessment

ORIGINAL ARTICLE

CLINICAL PRACTICE MANAGEMENT



Breast Cancer Screening in Women at Higher-Than-Average Risk: Recommendations From the ACR

EC: Editor's Choice

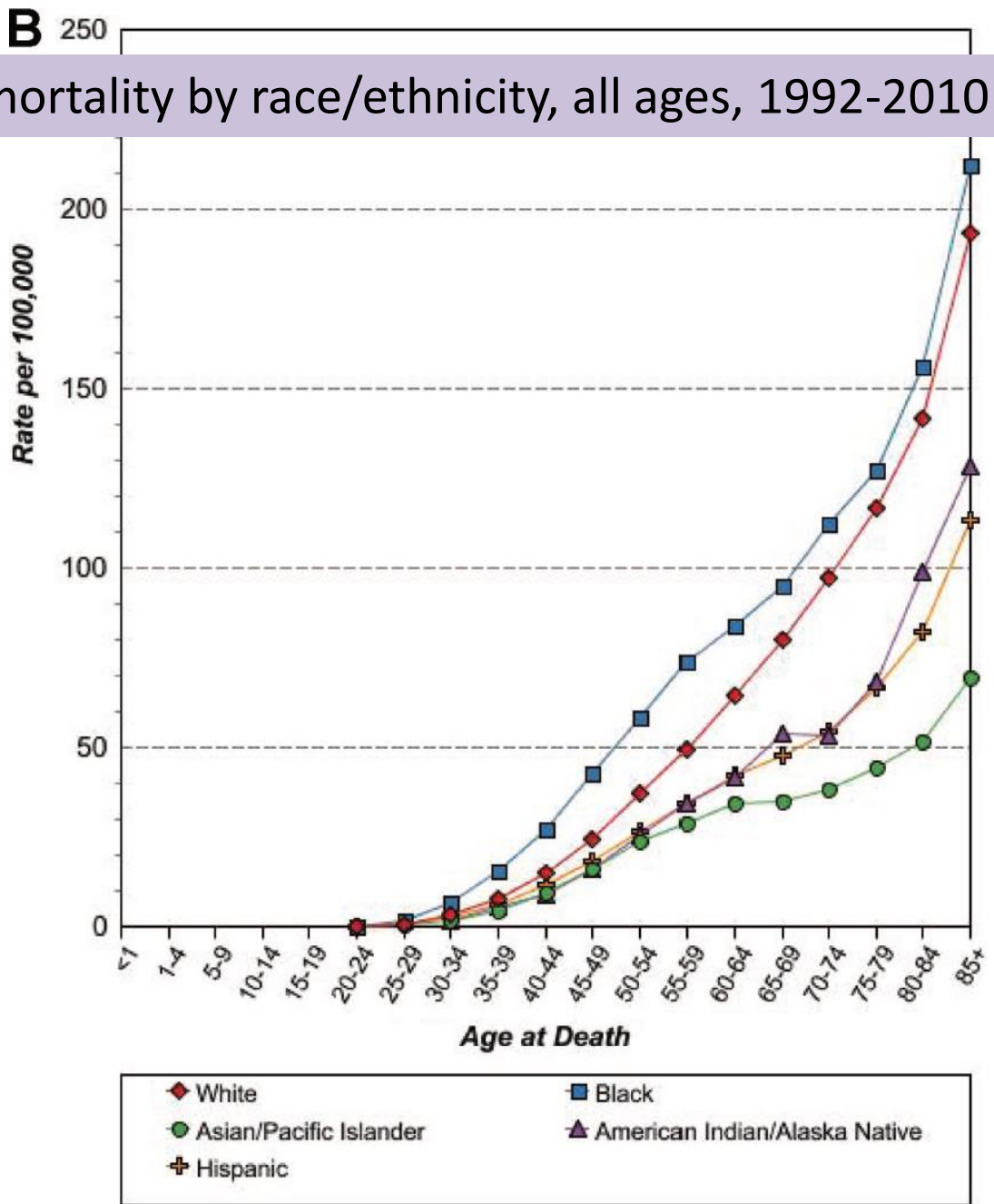
SA-CME

Debra L. Monticciolo, MD^a, Mary S. Newell, MD^b, Linda Moy, MD^c, Bethany Niell, MD, PhD^d,

SUMMARY

All women, especially **black** women and those of Ashkenazi Jewish descent, should be evaluated for breast cancer risk no later than age 30, so that those at higher risk can be identified and can benefit from supplemental screening.

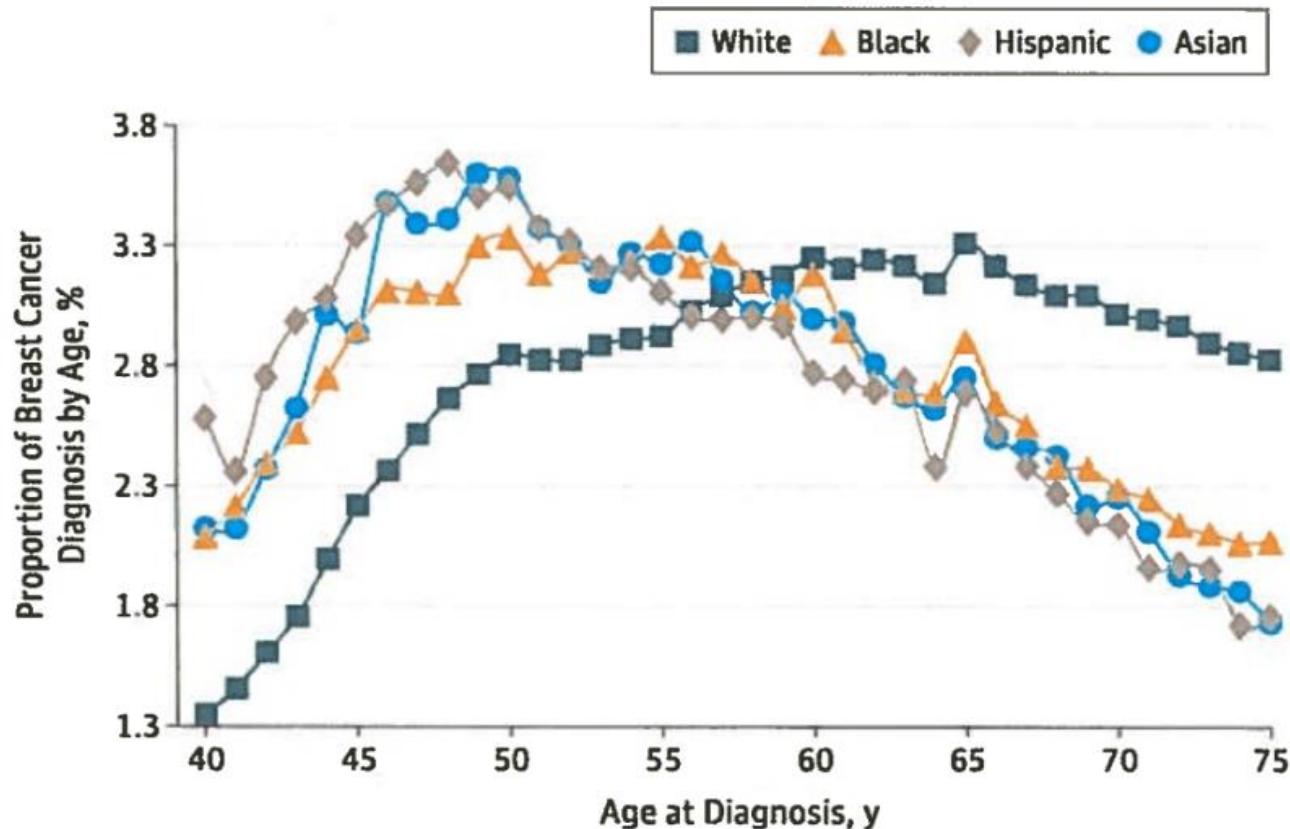
B 250
Breast cancer mortality by race/ethnicity, all ages, 1992-2010



Age at diagnosis by race



Figure 1. Distribution of Age at Diagnosis for Women With Breast Cancer



Stapleton et al 2018 reported that the proportion of breast cancer diagnosis by age of non-white patients with BC peaks in the late 40s, while diagnosis of white patients peaks in their 60s

Other considerations – rural women

Impact of health disparities on access to treatment

- In one study in GA, AA women living in **isolated rural areas** were **45% more likely to die than whites**
- **Immigrant women** are **less likely to access mammography care**
- **Rural women** are **more likely to choose therapies that require fewer visits** to providers



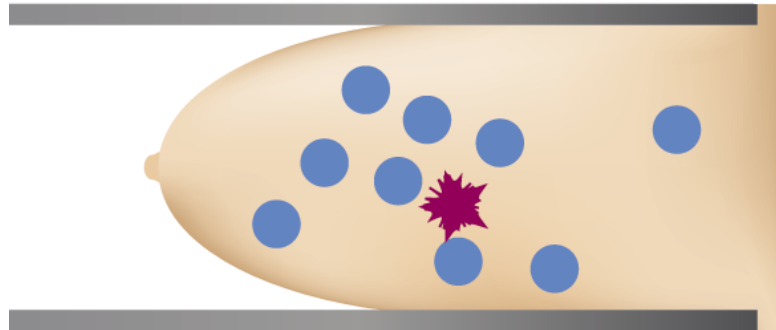
Imaging

- **Plain film** mammography obsolete
- All mammography is now **digital**
- **Tomosynthesis** is used to augment digital mammography
- **Breast ultrasound**
- **MRI**

Tomosynthesis (3D mammo)

FDA approved Feb 2011

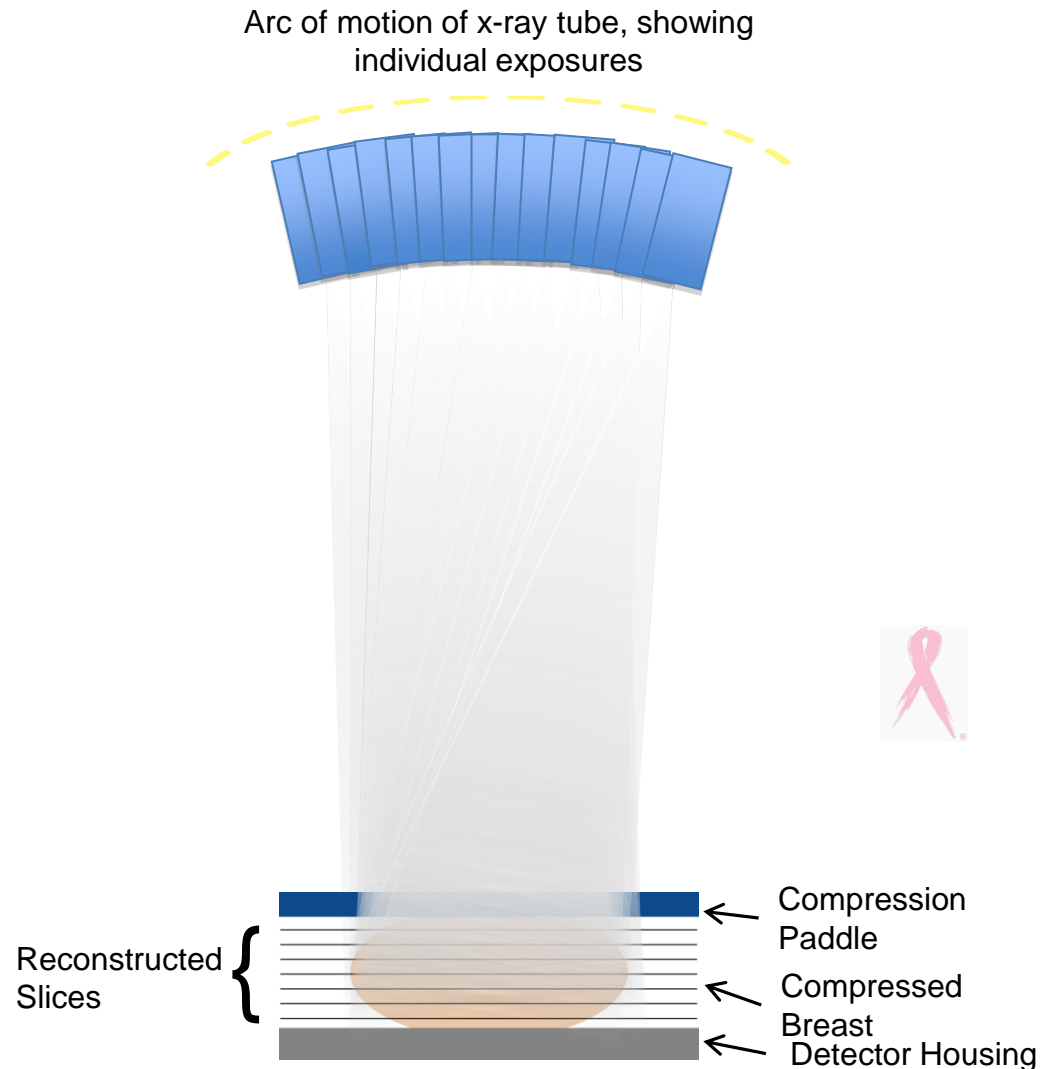
Increasingly used to augment digital
mammography (DM)



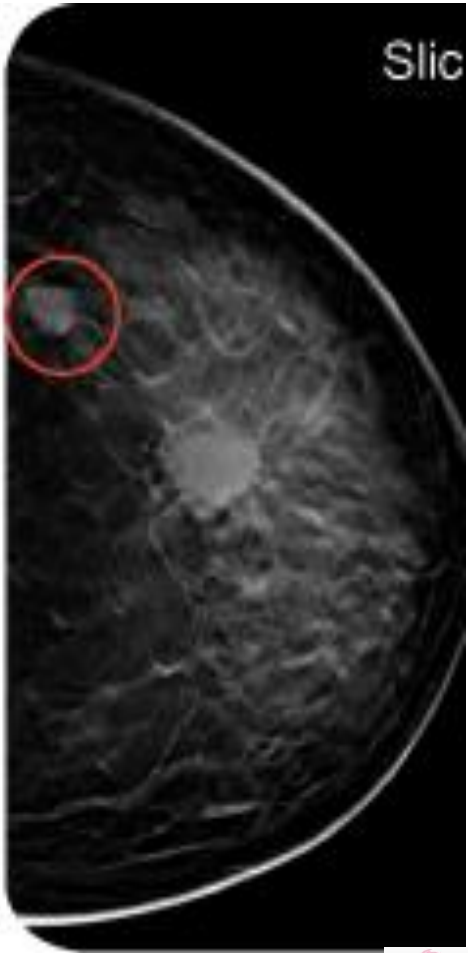
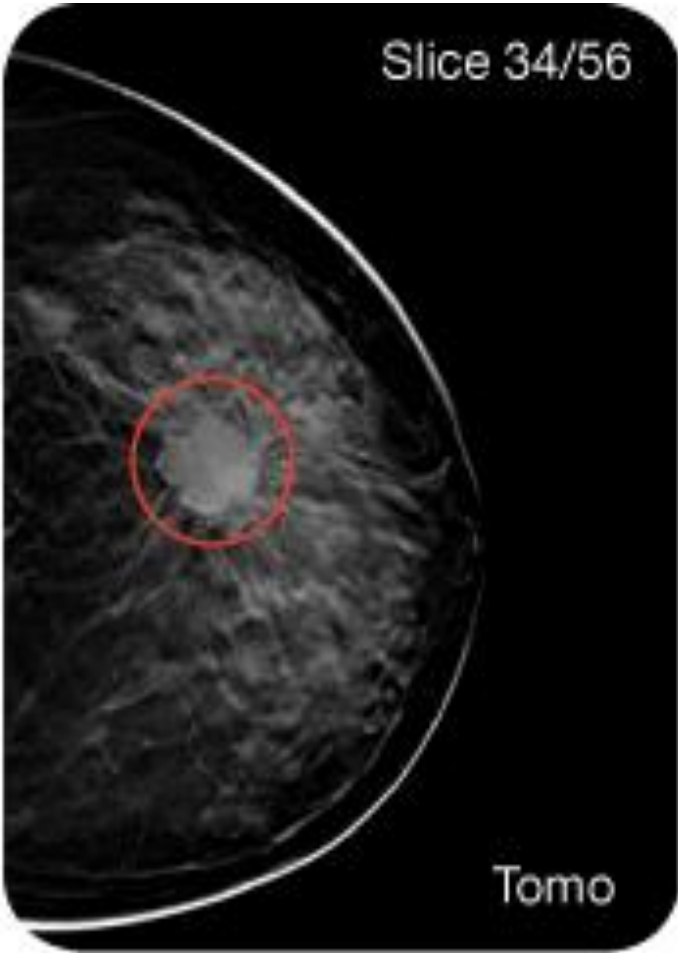
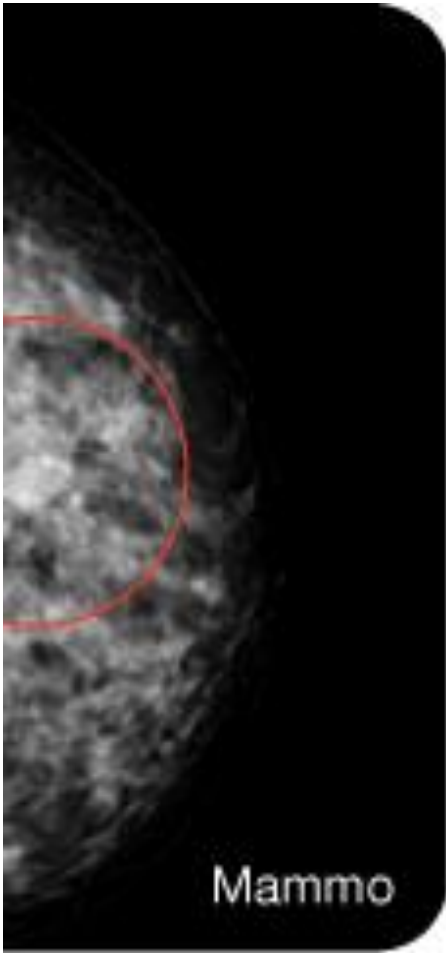
The problem of superimposed tissue

How it works

- X-ray tube moves in an arc across the breast
- A series of low dose images are acquired from different angles
- Total dose approximately the same as one 2D mammogram
- Projection images are reconstructed into slices

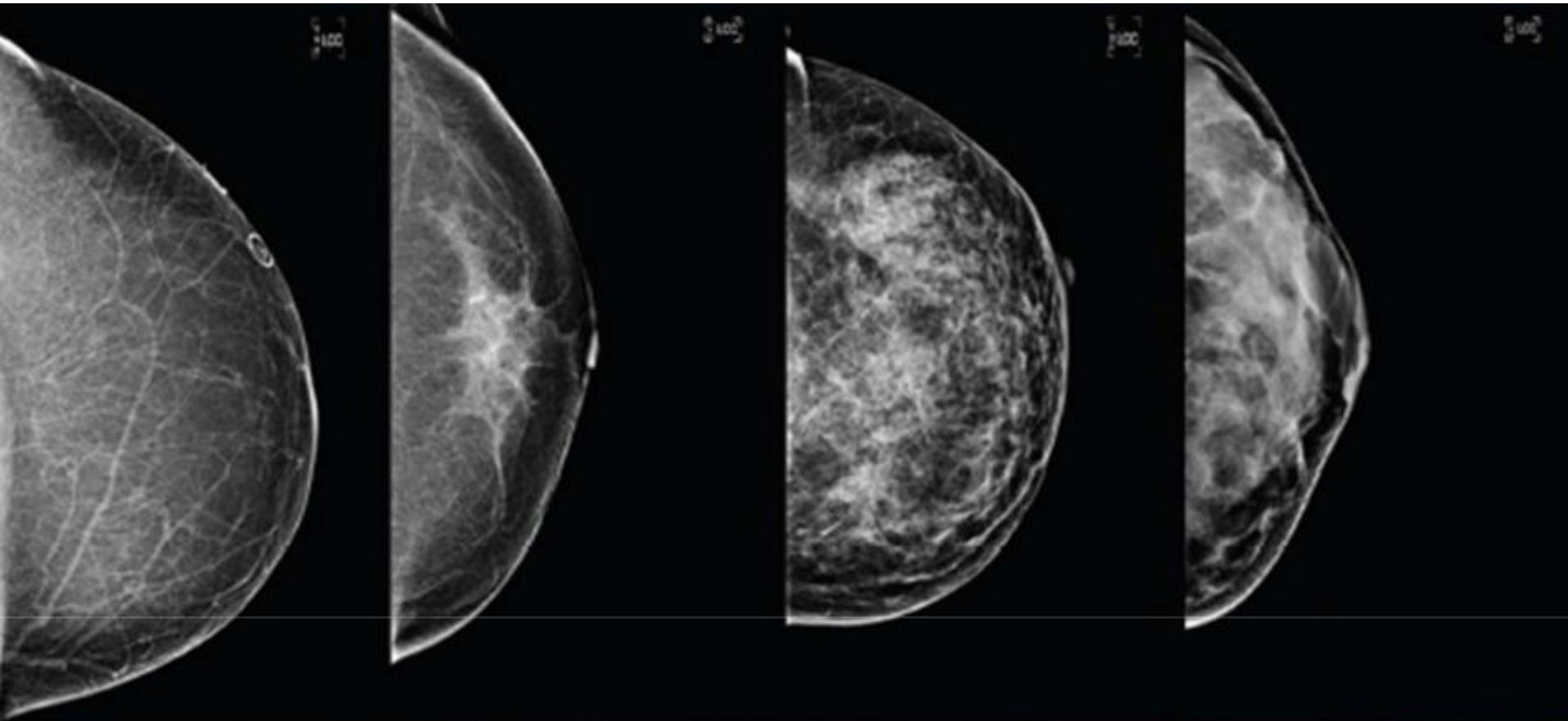


2D vs 3D views





Radiographic classification: breast density



Almost entirely
fatty

Scattered
fibroglandular
densities

Heterogeneously
dense

Extremely dense

Percent of population:

10%

43%

39%

8%

breast density

- Impacts the **effectiveness of screening**
- Density = **independent risk factor** for breast CA
- But has never been shown to increase breast cancer deaths!

Mandelson et al. Breast density as a predictor of mammographic detection: comparison of interval and screen detected cancers. J Natl Cancer Inst 2000; 92: 1081-1087

Boyd, Guo, Martin et al. Mammographic Density and the Risk and Detection of Breast Cancer. NEJM 2007;356:227.

ACOG Committee Opinion

Table 1. BI-RADS Breast Density Categories, Demographics, Sensitivity of Cancer Detection, and Breast Cancer Risk [↔]

BI-RADS Category	Description	Percentage of Population*	Sensitivity [†] (%)	Relative Risk of Breast Cancer [‡]
1	Almost entirely fat	10	88	---
2	Scattered fibroglandular densities	43	82	---
3	Heterogeneously dense	39	69	1.2 (compared with average breast density)
4	Extremely dense	8	62	2.1 (compared with average breast density)

Abbreviation: BI-RADS, Breast Imaging Reporting and Data System.

Smetana GW, Elmore JG, Lee CI, Burns RB. Should This Woman With Dense Breasts Receive Supplemental Breast Cancer Screening?: Grand Rounds in Medical

Committee Opinion Number 625, March 2015 **Management of Women With Dense Breasts Diagnosed by Mammography**

Washington state law

Effective January 1, 2019

Facilities must notify women if they have dense breasts

“If a physician determines that the patient has **heterogeneously dense or extremely dense breast tissue**, the health care facility must include a notice to the patient that explains that roughly half of all women have dense breast tissue and that this is normal but may make it difficult to evaluate a mammogram. The notice must also include encouraging patients to discuss this with their health care providers to decide future screening options.”

Breast Density



“Since Connecticut passed the first patient notification mandate in 2009...

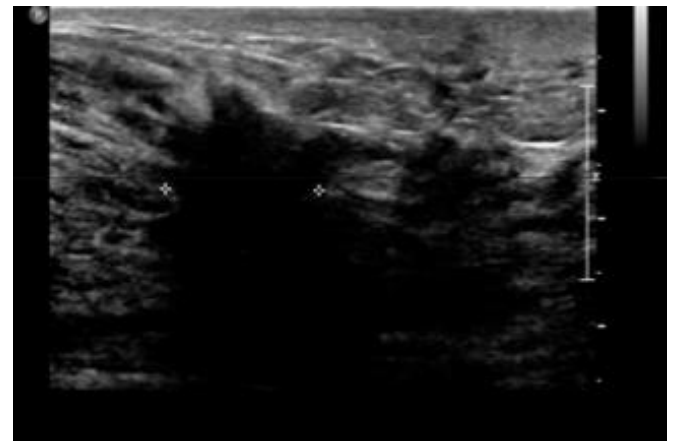
There are no clinical guidelines that recommend routine use of alternative or adjunctive tests in women with dense breasts who are asymptomatic and have no additional risk factors.”

Utility of screening ultrasound

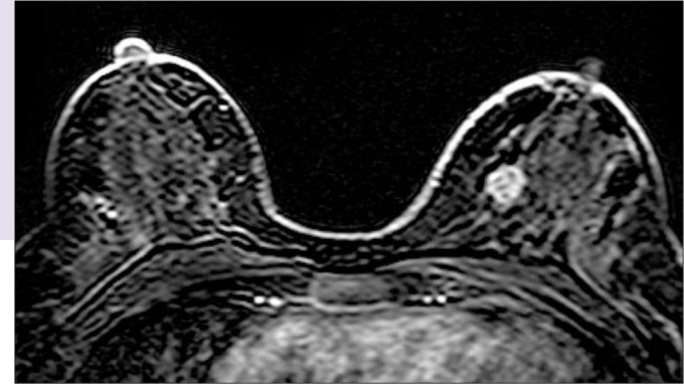
- ACRIN 666
 - Multicenter trial (2012) investigating mammography and physician-performed screening US for women with dense breasts or those at high risk (n=2637).
- **4.3 additional cancers with ultrasound per 1,000 patients**
 - Combined diagnostic accuracy was 91% vs 78% of mammography alone.

US drawbacks

- High false positive rate.
- Biopsy rate = 8.8% (vs biopsy rate of 1:40 for mammography alone)
- **Hand held US** performed by radiology lasting 10-20 mins (resource intensive)



MRI



- Recommended in women with $> 20\%$ lifetime risk
- Increased sensitivity compared to mammography
- Considerable cost, call backs
- Difficult to read (requires expertise / high volume)
- Difficult to tolerate
- Gadolinium

Breast cancer screening with imaging: from the society of breast imaging and the ACR on the use of mammography, breast MRI, breast ultrasound, and other technologies
Carol H Lee et al J Am Coll Radiol 2010

Conclusions

- Assess patients for family hx and other factors to assign **risk category**
- Bird-dog your **intermediate risk patients** to undergo regular screening mammography
- Look for continued advances in **breast imaging**
 - Better evidence on what to do about breast density (in years to come)

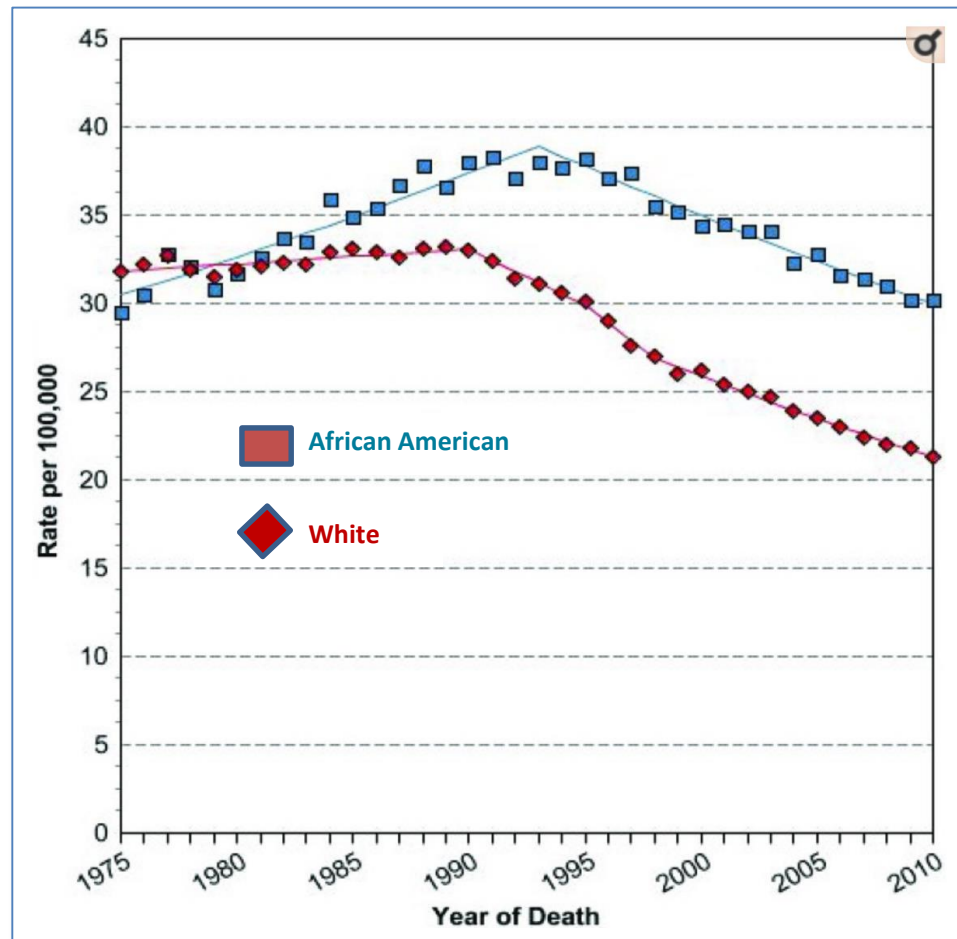
<http://www.appliedradiology.com/articles/breast-density-changes-the-breast-imaging-landscape>

Slide acknowledgements

Thank you for power point slide contributions, graphics and videos from

- Drs. Plecha, Clemow and Dutta in Cleveland
- Dr. Susan Barrow at UCSF Fresno
- Dr. Adelaide McClintock, MD at UW

Supplemental slides



Understanding Early Onset Breast Cancer

Risk Factors for Early Onset Breast Cancer

Topic: The Role of Health Disparities in EOBC

African Americans and other minorities face lower survival and worse prognosis

African American women in urban areas were 24% more likely to die than whites

African American women living in isolated rural areas were 45% more likely to die than whites

Gains have not been shared equally across all populations

Lack of coverage, and cost, limits access to primary care, and is a factor in patient decision-making regarding mammography

Patients receiving public option care had increased risk of mortality

Regional variations and the concentration of cancer specialists in urban areas impacts the quality of available care



What is the role of health disparities in early onset breast cancer?

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Understanding Early Onset Breast Cancer

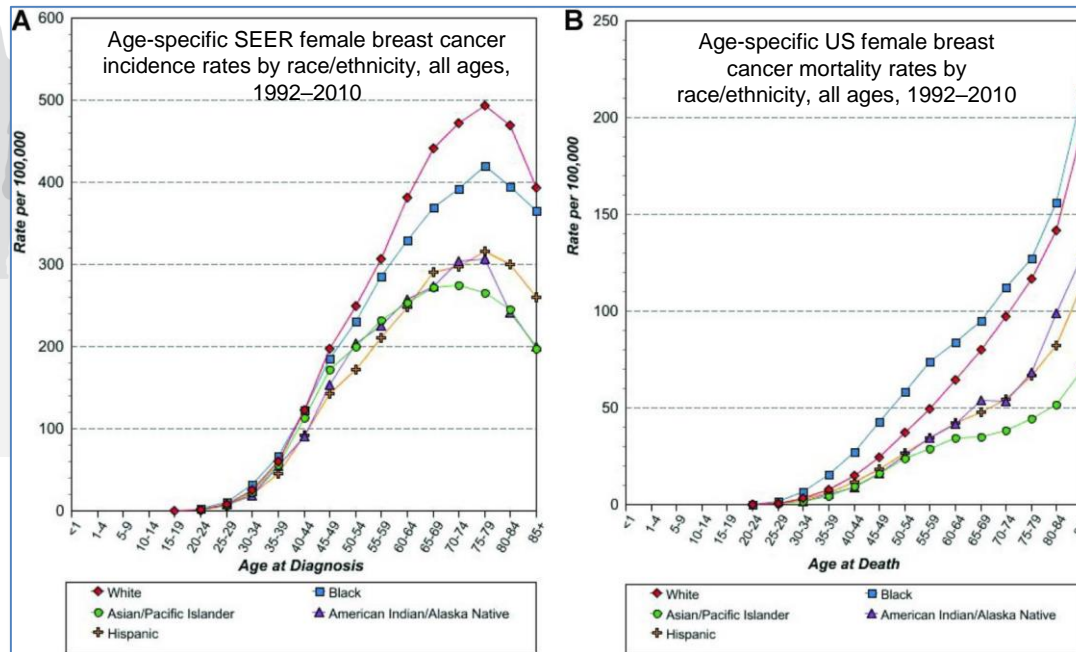
Risk Factors for Early Onset Breast Cancer

Topic: The Role of Health Disparities in EOBC

Breast cancer incidence and mortality by age at diagnosis and race/ethnicity.



African American



What is the role of health disparities in early onset breast cancer?

Source: Age-adjusted U.S. female breast cancer-specific mortality rates by race, 1975–2005. Wheeler S, Reeder-Hayes K, Carey L. Disparities in Breast Cancer Treatment and Outcomes: Biological, Social, and Health System Determinants and Opportunities for Research. The Oncologist 2013;18:986-993

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