



BREAST CANCER SCREENING: An Evidence Based Approach

Kathie-Ann Joseph, MD, MPH
Professor of Surgery and Population Health
Boca Raton Regional Hospital Internal Medicine
Symposium
03/24/24

BREAST SURGERY



1

Kathie-Ann Joseph, MD, MPH., faculty for this educational activity, has no relevant financial relationships with ineligible companies to disclose, and has indicated that the presentation or discussion will not include off-label or unapproved product usage.



Division/Department

2

2

AGENDA

Impact of Breast Cancer on Women

Does Mammography Save Lives?

When to Start and How Often Should Women Screen?

Special Populations



3

Breast Cancer: The Impact on Women



Division/Department

4

4

Breast Cancer Stats

Most common cancer diagnosed in women

12.8% of women will be diagnosed during lifetime

More than 331,000 new cases anticipated (268,600 invasive)

30% of all new cancer cases in women

41,760 women expected to die from breast cancer

3,477,866 women are living with breast cancer (based on 2016 data)



Source: <https://seer.cancer.gov/statfacts/html/breast.html>

5

Benefits of Mammography

- Number of women whose lives are saved because of mammography varies by age:
 - 5 of 10 000 women aged 40 to 49 years
 - 10 of 10 000 women aged 50 to 59 years
 - 42 of 10 000 women aged 60 to 69 years
- Higher than average risk women may benefit more from a mammogram



Pace and Keating. *JAMA*. 2014;311(13):

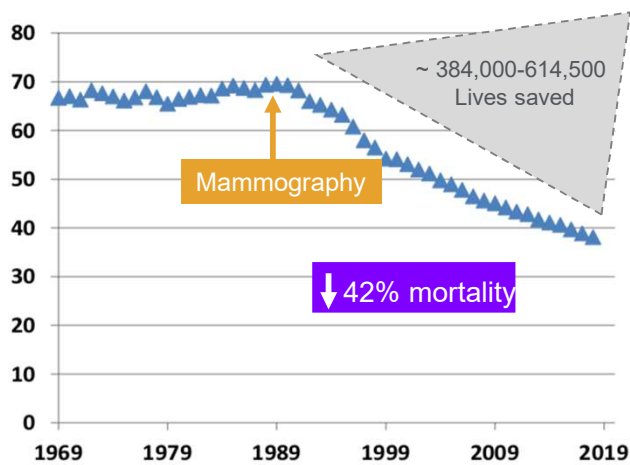
6

Has Mammography Reduced Breast Cancer Death?



7

Age-adjusted U.S. breast cancer mortality rates
(per 100,000)



Women aged 40–84 by year 1969–2015



YES -
MAMMOGRAPHY
HAS REDUCED
BREAST
CANCER
DEATHS

8

Evidence of Benefit: Overview

Decades of Evidence Prove Mammography Saves Lives

- Randomized controlled trials of women ages 40–74 show at least a 20% reduction in breast cancer deaths

Note: RCTs test only the “invitation to screening”

- Observational studies: show a mortality reduction of about 40%

Note: test actual mammogram use

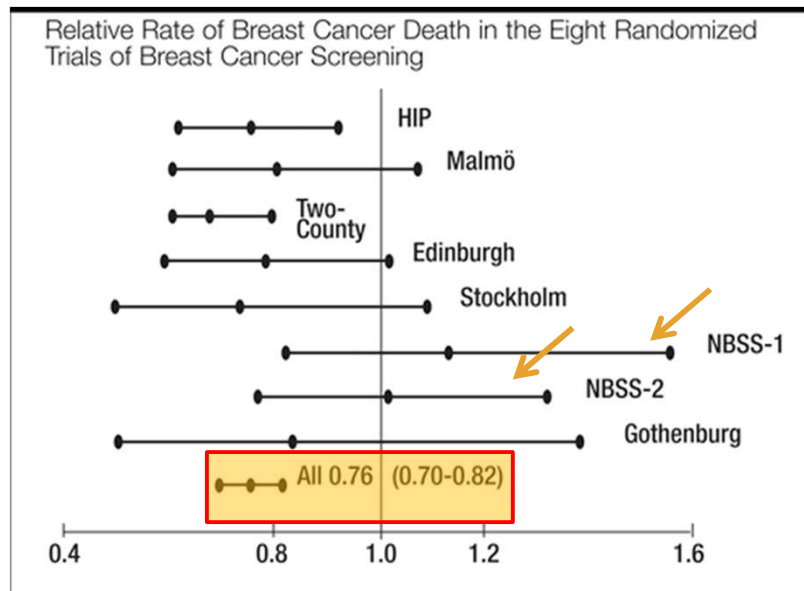
- Observational studies show benefits for women over 74, as well as the 40–74 age group

Evidence of Benefit: Randomized Controlled Trials (RCT)

11



24% mortality reduction



Duffy SW, Tabár L, Smith RA.
CA Cancer J Clin. 2002 Mar-Apr;52(2):68-71.

12

Evidence of Benefit: Observational Data

13

Evidence of Benefit: Observational Trials (Europe)

Why observational data matters

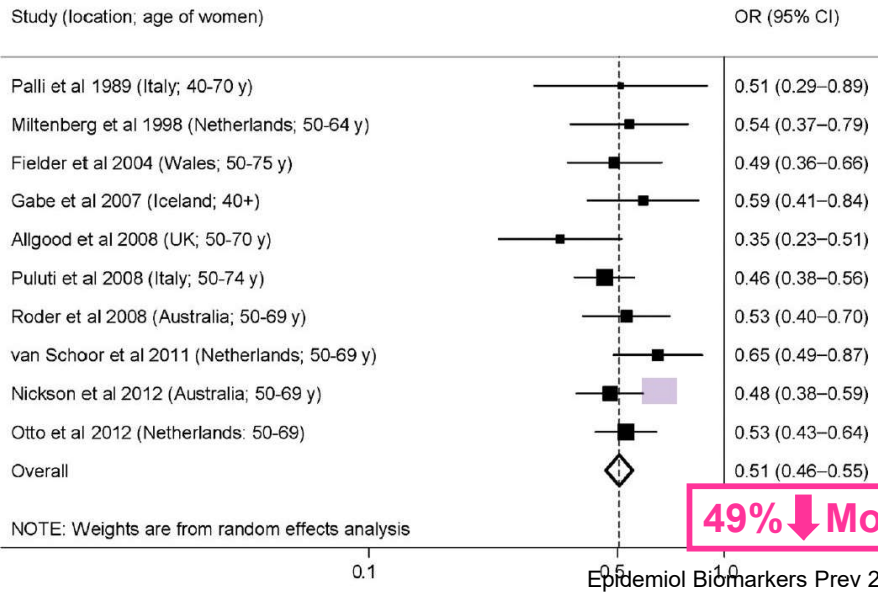
Randomized controlled trials UNDERESTIMATE benefit of screening

What European observational data shows¹

Magnitude of mortality reduction from screening mammography is greater than RCTs suggest, 38–49%

14

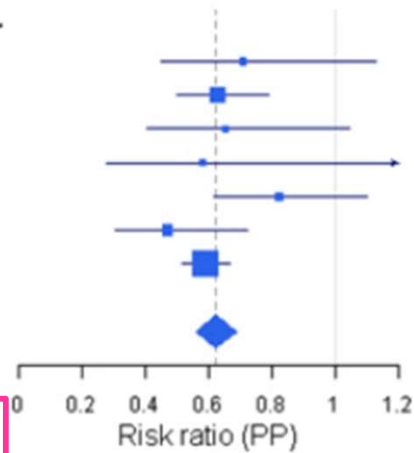
Case-Control Studies (Ages 40–75)



15

Evidence of Benefit: Observational Trials (Europe)

Study	RR	Lower	Upper
Hakama, (1997) ³⁹	0.71	0.45	1.13
Olsen, (2005) ³²	0.63	0.5	0.79
Sarkeala, (2008) ³⁶	0.65	0.41	1.05
Paci, (2002) ⁴²	0.58	0.28	1.22
Kalager, (2010) ⁵¹	0.82	0.62	1.1
Ascunce, (2007) ⁵³	0.47	0.31	0.73
SOSSEG, (2006) ⁵⁹	0.59	0.52	0.67
Summary (random)	0.62	0.56	0.69



Broeders et al J Med Sci 2012

16

Benefits of Screening: Additional Considerations

17

Benefits of Screening

40% drop in breast cancer death

Less extensive surgery for screening detected cancers

Less chemotherapy for screening detected cancers

Chemotherapy is MORE EFFECTIVE for screened women

Tabar, et al. Cancer 2018 125: 515-523

18

Mammographically Detected Cancers Are Just Different

More effectively treated

Women in their 40s and women >75 have lower stage disease, less treatment and better disease-specific survival

The method of detection is an independent prognostic factor for breast cancer mortality



19


Screening Mammography Guidelines



20




21




BREAST CANCER SCREENING GUIDELINES

Screening Guidelines - Comparison*

	ACR/SBI	ACS	ACOG	AMA	NCCN	USPSTF
Age to Start Mammography	40	45 Option to start at age 40	Offer at 40, not later than 50	40	40	
Age to Stop Mammography	When life expectancy is < 5-7 years	When life expectancy is < 10 years	Age 75, then shared decision	Not stated	Not stated	74 years
Mammography Interval	Annual	Annual 45-54; Every 1 or 2 years 55 and older	Every 1 or 2 years	Annual	Annual	Every 2 years
View on Tomosynthesis (3D) Mammography	No longer investigational; an advance in breast imaging	Improvement in detection, lower chance of recall	Not stated	Not stated	Improves cancer detection, reduces call back rates	Insufficient evidence to support routine use; grade "I"

*Adapted from: http://www.bwhi.org/clientuploads/directory/issues_resources/Comparison-Chart-December-15.pdf Rev. July 27, 2017



22

Follow-up Testing Risks of Mammography Screening

Out of every **100** women who get a screening mammogram:

90 will be told that their mammograms are normal



10 will be asked to return for additional mammograms or ultrasounds

6 will be reassured that their mammograms are normal



2 will be asked to return in 6 months for a follow-up exam



2 will be recommended to have a needle biopsy



 **Mammography Saves Lives®**
... one of them may be yours

To learn more about mammography benefits and risks visit MammographySavesLives.org

23

Risks: Recall & Biopsy

“False Positives” and anxiety are commonly presented as risks

Risks from recall and biopsy must be compared to the 40% reduction in breast cancer deaths due to screening mammography

Short-term anxiety from screening resolves, and women have no long term anxiety nor adverse health effects

24

Breast Cancer Screening of Women at Higher Than Average Risk

25

Higher risk women need supplemental and earlier screening

Risk	DM +/- DBT	MRI+
Known genetic mutation or lifetime risk $\geq 20\%$	Annually starting at age 30	Annually starting at age 25–30
Breast cancer history and dense breasts at any age or breast cancer diagnosed <age 50	Annually starting at time of diagnosis	Annually starting at time of diagnosis
History of chest radiation therapy before age 30	Annually starting at age 25 or 8yrs after therapy (whichever is later)	Annually starting at age 25–30
History of ADH, ALH, LCIS or personal breast cancer history other than above	Annually starting at time of diagnosis	Consider annually starting at time of diagnosis

26

Whole Breast Ultrasound

No additional value for **high-risk** women who can undergo screening MRI

There is insufficient evidence to support supplemental screening in average risk women



Monticciolo DL et al, J Am Coll Radiol 2018;15:408-414

27

Annual or Biennial Screening?

- Annual screening results in more screening detected tumors, tumors of smaller size and fewer interval cancers than biennial screening which is a key determinant of survival
- Interval cancers presenting in the second year after a negative mammogram caused 34% of the deaths from breast cancer in screened women and 47% of the breast cancer deaths in women 40-49 years old



28

Transgender and Gender Diverse Patients

- For average risk transgender patients, recommendations depend on sex assigned at birth, use and duration of hormones and surgical history and are based on limited data and expert opinion.
- Annual screening at 40 is recommended for transfeminine (male to female) patients who have used hormones for ≥ 5 years, as well as for transmasculine (female-to-male) patients who have not had a mastectomy.



29

RISK ASSESSMENT IN BLACK WOMEN

Women of average risk obtain screening mammography at age 40
 Baseline risk assessment at age 25
 Allows for more timely supplemental screening
 Distinguish this population's risk and needs



Ann Surg Oncol (2023) 30:58–67
<https://doi.org/10.1245/s10434-022-12535-8>

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY



REVIEW ARTICLE – BREAST ONCOLOGY

The Landmark Series—Addressing Disparities in Breast Cancer Screening: New Recommendations for Black Women

Oluwadamilola M. Fayanju, MD, MA, MPH^{1,2,3,4}, Christine E. Edmonds, MD^{2,5},
 Sylvia A. Reyes, MD^{6,7,8}, Cletus Arciero, MD, MS⁹, Vivian J. Bea, MD¹⁰, Angelena Crown, MD¹¹, and
 Kathie-Ann Joseph, MD, MPH^{12,13}

Fayanju, et al. Ann Surg Oncol. 2023 (30) 58-67.

30

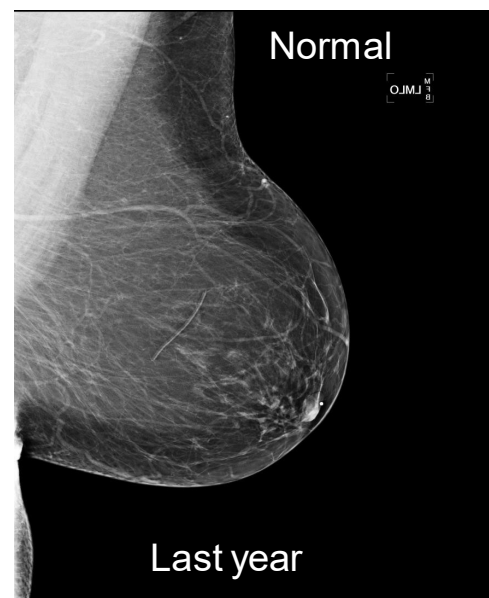
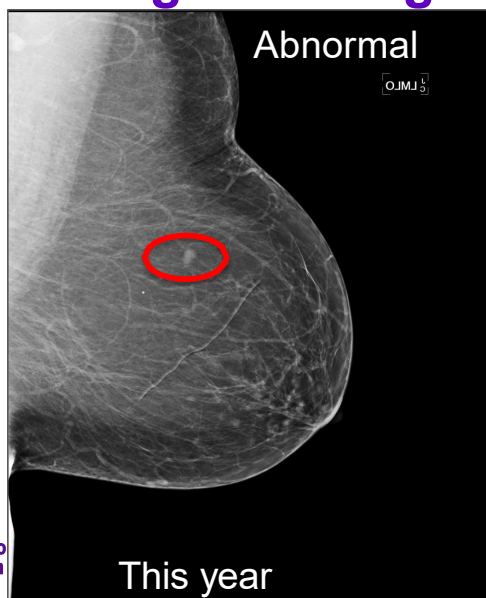
All women, especially black women and women of Ashkenazi Jewish descent should be evaluated for breast cancer risk by age 30 to:

- Identify those at higher risk than average
- Benefit from supplemental screening



31

Screening Mammogram



32

Late-stage Breast Cancer

Symptomatic



33

Take-Home Points

For average-risk women, most lives saved:

- Start at age 40-50
- Screen annually

For high-risk, women:

- Start at age 30
- Screen annually
- Supplemental screening with MRI
- Screening mammography particularly for women in their 40s results in tumors detected at smaller sizes, earlier stages, better surgical options, and more effective chemotherapy



34

References

- Pace and Keating. JAMA. 2014;311(13):
- Duffy SW, Tabár L, Smith RA.
- CA Cancer J Clin. 2002 Mar-Apr;52(2):68-71.
- Tabar, et al. Cancer 2018 125: 515-523
- Monticciolo DL et al, J Am Coll Radiol 2018;15:408-414



35

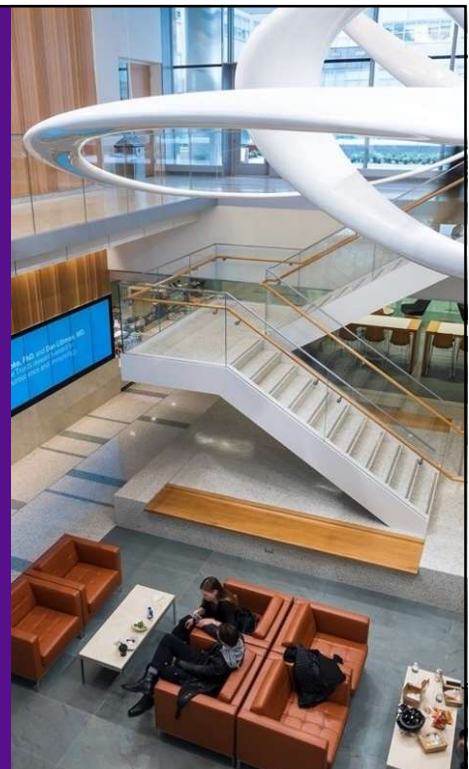


Thank you

Kathie-Ann.Joseph@nyulangone.org



BREAST SURGERY



36