



# Breast Cancer Screening

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with American Cancer Society, Hilton San Gabriel, CA**

# Disclosures

The following CME planners and faculty do not have relevant financial relationships with ineligible companies in the past 24 months:

- Leilanie Mercurio, L.A. Care Provider Continuing Education (PCE) Program Manager, CME Planner.
- Bridget Freeley, Associate Director, State Partnerships, American Cancer Society, CME Planner.
- Veronica Jones, MD, FACS, Chief, Division of Breast Surgery, City of Hope, CME Faculty.

An ineligible company is any entity whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

Commercial support was not received for this CME/CE activity.

# Learning Objectives:

- 1) Summarize updated breast cancer screening guidelines from various societies.
- 2) Describe risk assessment tools to identify high risk individuals.
- 3) Explain differences between high-risk screening vs average risk screening.
- 4) Identify three social determinants of health posing barriers to equity in breast cancer screening.

# Overview

- Breast Cancer Incidence
  - Disparities
- Current Screening Guidelines for Average Risk Individuals
- Management of the High-Risk Individual
  - Identification
    - Risk Assessment Tools
  - Management
    - Surveillance (Screening Modalities)
- Advances in Screening Modalities
- Barriers to Screening Adherence
- Solutions to Overcome Barriers

# Breast Cancer Incidence



# Incidence/Quick Facts

- One in eight women will develop breast cancer in their lifetime (**12.9%**)
- Incidence increases with age
- Most common cancer in women
- Third leading cause of cancer death in women
- Overall 90% 5 year survival
- Approximately 3 million survivors currently living in US
- 100 times more common in women than in men

# Incidence by Age

**Table 1. Estimated New DCIS and Invasive Breast Cancer Cases and Deaths Among Women by Age, US, 2022**

Age	DCIS cases		Invasive cases		Deaths	
	Number	%	Number	%	Number	%
<40	1,230	2%	10,850	4%	1,090	3%
40-49	8,050	16%	36,710	13%	2,950	7%
50-59	12,830	26%	65,980	23%	7,150	17%
60-69	16,030	31%	84,200	29%	10,270	24%
70-79	10,450	20%	61,470	21%	10,010	23%
80+	2,810	5%	28,640	10%	11,780	27%
<b>All ages</b>	<b>51,400</b>		<b>287,850</b>		<b>43,250</b>	

Estimates are rounded to the nearest 10. Percentages may not sum to 100 due to rounding. DCIS = Ductal carcinoma in situ.

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**Table 2. Age-specific Ten-year Probabilities of Breast Cancer Diagnosis or Death for US Women, 2017-2019**

Current age	Diagnosed with invasive breast cancer	Dying from breast cancer
20	0.1% (1 in 1,439)	<0.1% (1 in 18,029)
30	0.5% (1 in 204)	<0.1% (1 in 2,045)
40	1.6% (1 in 63)	0.1% (1 in 674)
50	2.4% (1 in 41)	0.3% (1 in 324)
60	3.5% (1 in 28)	0.5% (1 in 203)
70	4.1% (1 in 24)	0.7% (1 in 137)
80	3.0% (1 in 33)	1.0% (1 in 100)
<b>Lifetime risk</b>	<b>12.9% (1 in 8)</b>	<b>2.5% (1 in 39)</b>

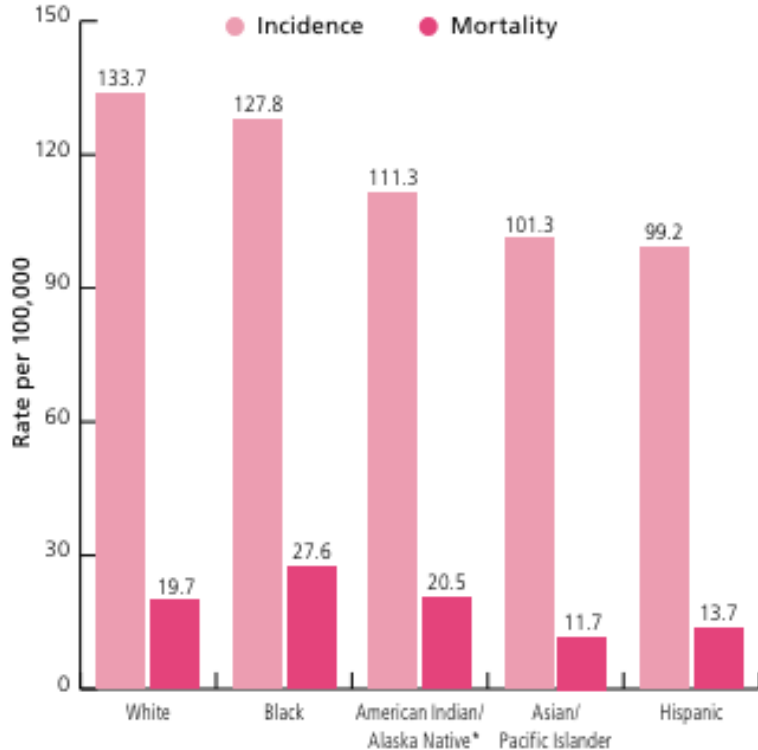
Note: Probability is among those who have not been previously diagnosed with breast cancer and reflects the likelihood of diagnosis/death within 10 years of current age. Percentages and "1 in" numbers may not be numerically equivalent due to rounding.

Source: DevCan, Version 6.8.0

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# Incidence by Race/Ethnicity

**Figure 3. Female Breast Cancer Incidence (2015-2019) and Death (2016-2020) Rates by Race/Ethnicity, US**

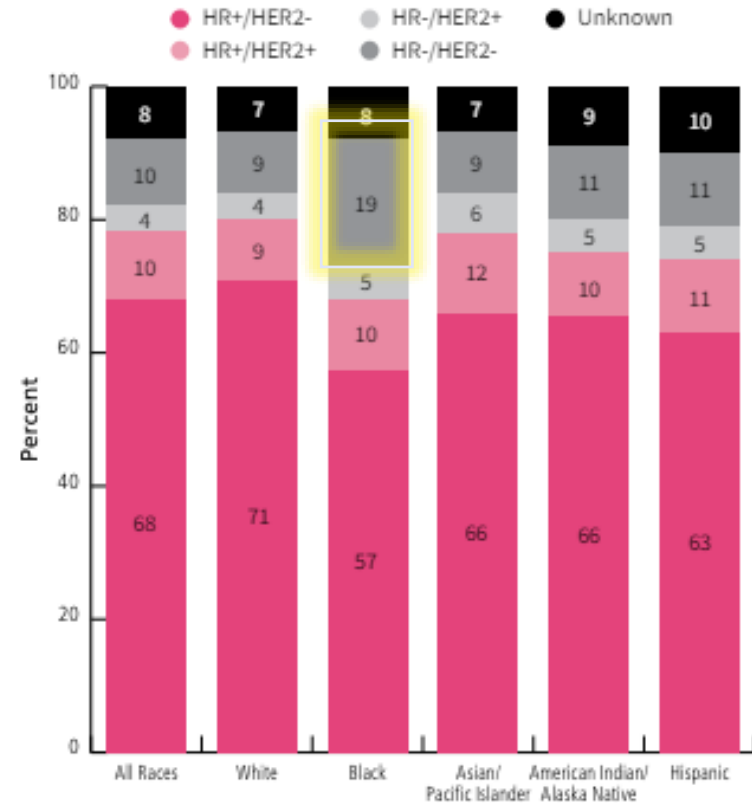


Note: Rates are per 100,000 and age adjusted to the 2000 US standard population. Race is exclusive of Hispanic origin. \*To reduce racial misclassification, incidence data are confined to PRCDA counties, while mortality data are for the entire US with adjustment factors for racial misclassification applied. (See Sources of Statistics, page 34).

**Sources:** Incidence – NAACCR, 2022. Mortality – National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention, 2022.

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**Figure 4. Distribution of Breast Cancer Subtypes by Race/Ethnicity, Ages 20 and Older, US 2015-2019**



HR = hormone receptor; HER2 = human epidermal growth factor receptor 2. Note: Except for all races, race is exclusive of Hispanic origin. Data for American Indians/Alaska Natives are based on Purchased/Referred Care Delivery Area (PRCDA) counties.

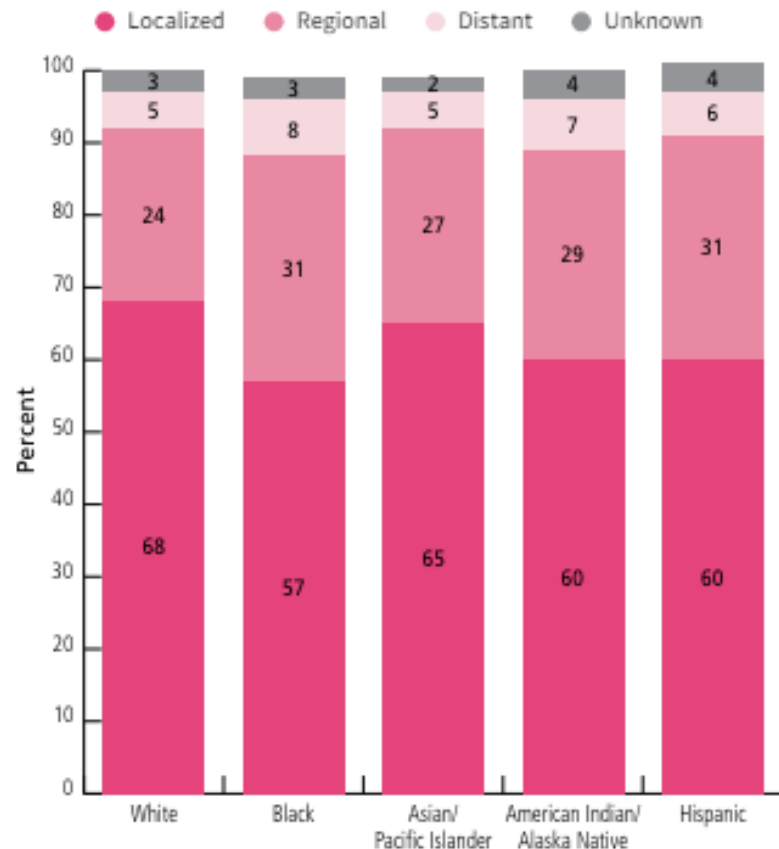
**Source:** NAACCR, 2022.

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# Presentation Stage by Race/Ethnicity

**Figure 5. Female Breast Cancer Stage Distribution, by Race/Ethnicity, Ages 20 and Older, US, 2015-2019**



Note: Race is exclusive of Hispanic origin. Estimates may not sum to 100 due to rounding. Data for American Indians/Alaska Natives are based on Purchased/Referred Care Delivery Area (PRCDA) counties.

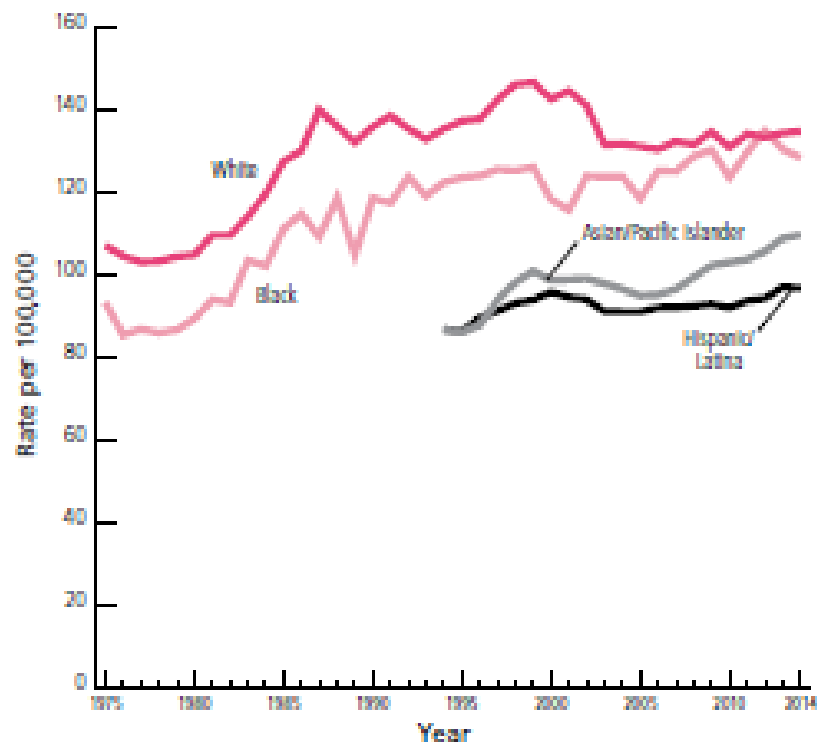
Source: NAACCR, 2022.

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- Black and Hispanic women more likely to present with locally advanced or metastatic disease than non-Hispanic White women

# Change in Incidence Over Time

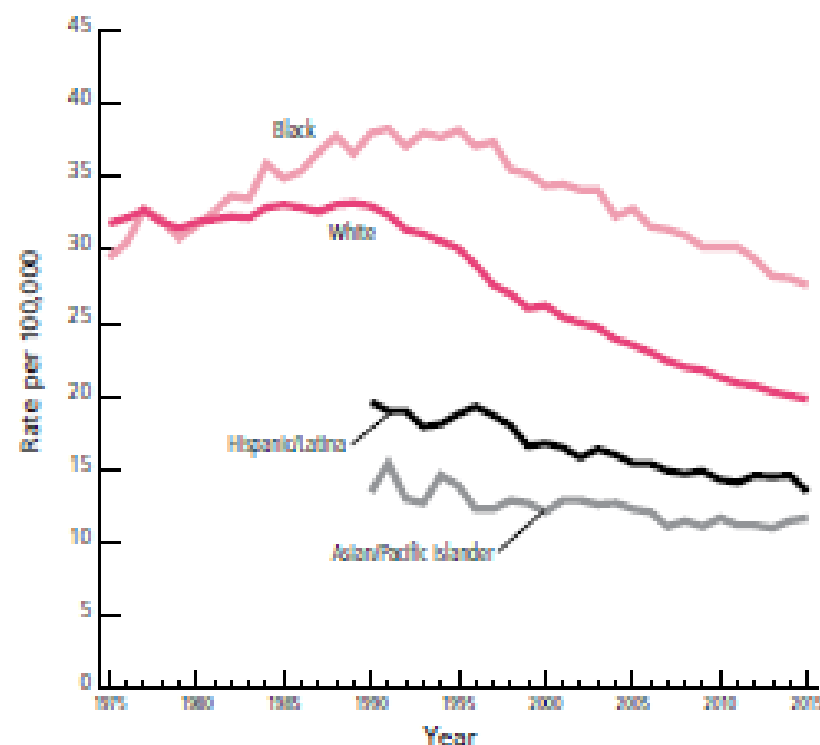
Figure 6a. Trends in Female Breast Cancer Incidence Rates by Race/Ethnicity, 1975-2014, US



Note: Rates are age adjusted to the 2000 US standard population and adjusted for reporting delays.

Source: SEER Program, National Cancer Institute, 2017. Data for whites and blacks are from the 9 SEER registries and data for other races/ethnicities are 3-year moving averages from the 13 SEER registries. For Hispanics, incidence data do not include cases from the Alaska Native Registry. Data for AMAN not shown due to small counts and unstable rates.

Figure 6b. Trends in Female Breast Cancer Death Rates by Race/Ethnicity, 1975-2015, US



Note: Rates are age adjusted to the 2000 US standard population.

Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2017. Rates for Hispanics exclude deaths from Louisiana, New Hampshire, and Oklahoma. Data for AMAN not shown due to small counts and unstable rates.

# Current Screening Guidelines



# Average Risk Screening Guidelines

	Age (yrs) to Start Mammography	Age to Stop Mammography	Mammography Interval
ACR/SBI	40 <sup>a</sup>	No age limit, tailor to individual health status	Annual
ACS	45 Option to start at age 40	When life expectancy is < 10 years	Annual 45-54; Every 1 or 2 years 55+
ACOG	Offer at 40, not later than 50	Age 75, then shared decision making	Every 1 or 2 years
AMA	40	Not Stated	Annual
ASBrS	40	When life expectancy is < 10 years	Annual
NCCN	40	Upper age limit for screening is not yet established	Annual
USPSTF	50	74 years	Every 2 years

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Rev. April 2020

<sup>a</sup>Black, Hispanic, and Asian women have peak incidence of breast cancer in their 40s and should begin screening at least by age 40 [1, 2].

## References Cited

1. Monticciolo DL, Newell MS, Moy L, Niell B, Monsees B, Sickles EA. Breast Cancer Screening in Women at Higher-Than-Average Risk: Recommendations from the ACR. *J Am Coll Radiol* 2018; 15:408-414;
2. Stapleton SM, Oseni TO, Bababekov YJ, Hung Y, Chang DC. Race/Ethnicity and Age Distribution of Breast Cancer Diagnosis in the United States

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# Average Risk Screening Guidelines

## Recommendation Summary

Population	Recommendation	Grade
Women aged 40 to 74 years	The USPSTF recommends biennial screening mammography for women aged 40 to 74 years.	<b>B</b>
Women 75 years or older	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening mammography in women 75 years or older.	<b>I</b>
Women with dense breasts	<p>The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of supplemental screening for breast cancer using breast ultrasonography or magnetic resonance imaging (MRI) in women identified to have dense breasts on an otherwise negative screening mammogram.</p> <p>See the "Practice Considerations" section for more information on the patient population to whom this recommendation applies and on screening mammography modalities.</p>	<b>I</b>

Reference: <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening#bcei-recommendation-title-area>

# Average Risk Screening Guidelines



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# Management of the High-Risk Individual



# Risk Assessment Guidelines

- **ALL women should have risk assessment by age 25**
  - Especially true for Ashkenazi Jewish and Black women
    - Ashkenazi Jewish women have 1 in 40 chance of BRCA mutation
    - In 2018, American College of Radiology and Society of Breast Imaging added Black women to high-risk group
- High Risk Group
  - Gene mutation, such as a BRCA1 or BRCA2 mutation, linked to breast cancer
  - Previous radiation to the chest or face
  - Ashkenazi Jewish descent
  - Strong family history of breast cancer
  - Dense breasts
  - Certain benign breast conditions

# Personal History Increasing Breast Cancer Risk

- Getting older
- Starting periods early (13)
- Starting menopause late (50)
- Late or no pregnancy
- Taking birth control pills
- Taking hormone therapy after menopause
- Gaining weight/diabetes
- Lifestyle (diet/exercise)
- Drinking alcohol/tobacco
- Certain beauty products
- Having dense breasts
- Having a lot of breast biopsies in the past
- Having other breast diseases
- Having radiation as a child
- Having breast cancer in the past

# Beauty Products that Increase Risk

- Parabens used in makeup, moisturizers, hair care products, shaving creams/gels (not usually in deodorants)
  - Act like estrogen in the body
- Phthalates used in nail polish and hair spray

<https://www.bench2community.org/resources>

<https://www.ewg.org/skindeep/>

## RESOURCES: APPS

Looking for safer product options but don't know where to start? Check out the following apps that can help you make informed decisions when purchasing personal care products.

**Click on each button to be redirected to their website.**

**Learn more about each app on the next page (scroll down)!**

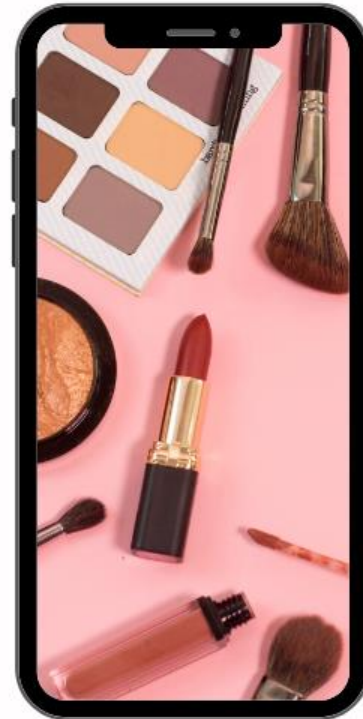
[Clearya](#)

[EWG Healthy Living](#)

[Detox Me](#)

[Think Dirty](#)

[CosmEthics](#)



# Benign Pathology that Increases Risk

## Proliferative

- Without atypia (3-4 fold)
  - Intraductal papilloma
  - Sclerosing adenosis
  - Radial scar
- With atypia (4-5 fold)
  - Atypical lobular hyperplasia
  - Atypical ductal hyperplasia
  - Lobular carcinoma in situ



## NCCN Guidelines Version 3.2024 Hereditary Cancer Testing Criteria

TESTING CRITERIA FOR HIGH-PENETRANCE BREAST CANCER SUSCEPTIBILITY GENES  
(Specifically *BRCA1*, *BRCA2*, *CDH1*, *PALB2*, *PTEN*, *STK11*, and *TP53*. See [GENE-A](#))<sup>a,f,g,h,i</sup>

**Testing is clinically indicated in the following scenarios:**

- See General Testing Criteria on [CRIT-1](#).
- Personal history of breast cancer with specific features:
  - ▶ ≤50 y
  - ▶ Any age:
    - ◊ Treatment indications
      - To aid in systemic treatment decisions using PARP inhibitors for breast cancer in the metastatic setting<sup>j,k</sup> ([NCCN Guidelines for Breast Cancer](#))
      - [To aid in adjuvant treatment decisions with olaparib for high-risk](#),<sup>l</sup> HER2-negative breast cancer<sup>j</sup>
    - ◊ Pathology/histology
      - Triple-negative breast cancer
      - Multiple primary breast cancers (synchronous or metachronous)<sup>m</sup>
      - Lobular breast cancer with personal or family history of diffuse gastric cancer [NCCN Guidelines for Gastric Cancer](#)
    - ◊ Male breast cancer
    - ◊ Ancestry: Ashkenazi Jewish ancestry
  - ▶ Any age (continued):
    - ◊ Family history<sup>n</sup>
      - ≥1 close blood relative<sup>o</sup> with ANY:
        - breast cancer at age ≤50
        - male breast cancer
        - ovarian cancer
        - pancreatic cancer
        - prostate cancer with metastatic,<sup>p</sup> or high- or very-high-risk group (Initial Risk Stratification and Staging Workup in [NCCN Guidelines for Prostate Cancer](#))
      - ≥3 diagnoses of breast and/or prostate cancer (any grade) on the same side of the family including the patient with breast cancer

# Family History Increasing Risk of Breast Cancer

- Family history of cancer only
  - ▶ Individuals affected with breast cancer (not meeting testing criteria listed above) or individual unaffected with breast cancer with a first- or second-degree blood relative meeting any of the criteria listed above (except unaffected individuals whose relatives meet criteria only for systemic therapy decision-making).<sup>q</sup>
  - ▶ Individuals affected or unaffected with breast cancer who otherwise do not meet the criteria above but have a probability >5% of a *BRCA1/2* P/LP variant based on prior probability models (eg, Tyrer-Cuzick, BRCAPro, CanRisk)<sup>r</sup>

- FAMILY HISTORY

- WHO (both sides)
  - WHAT
  - HOW OLD
  - WHAT HAPPENED
- 
- One first degree relative-2 times higher
  - Two or more first degree relatives-3-4 times higher



# Determining Risk

- Personal risk depends on:
  - Family history
  - Obstetrical history (menarche, menopause, hormone pills, children, breastfeeding)
  - Lifestyle factors (alcohol, tobacco, exercise)
  - Breast history (previous biopsies, surgeries)
- Tests can estimate your personal risk of getting breast cancer
- Only 5-10% of breast cancers are genetic
- High risk is considered lifetime risk  $\geq 20\%$

# Genetic Testing Criteria

- (Any) Cancer runs in the family
- Family member with Breast cancer when less than 50 years old
- Family member with aggressive breast cancer when less than 60 years old
- Two breast cancers in your lifetime
- Breast cancer at any age and someone in your family had it when very young
- Ovarian cancer
- Pancreatic cancer
- Male breast cancer

# Components of Genetic Counseling

- Review of family history
- Review of the most likely genes
- Blood/saliva test
  
- Genetic Testing
  - Discussion of results
- Assessment of risk for breast cancer
  - Risk Assessment models should be used to estimate risk

# Risk Assessment Models

- At least 24 breast cancer risk assessment models
- Age
- Family history of breast cancer
- Genetic mutations
- Race/ethnicity
- Breast density
- Hormone exposure
- Menarche
- Previous breast biopsies
- Menopause
- Childbirth history

# Breast Cancer Risk Assessment Tool (Gail Model)

- Developed in 1989 by Dr. Mitchell Gail
- Administrated by U.S. National Cancer Institute
- Most popular
- Takes approximately 5 minutes to complete
- Estimates 5-year risk and lifetime risk up to age 90
- Age, race/ethnicity, childbirth history, previous breast biopsies, menarche, family history of breast cancer
- Should not be used if personal history of breast cancer, known pathogenic variant

<https://bcrisktool.cancer.gov>

# Breast Cancer Risk Assessment Tool

**NATIONAL CANCER INSTITUTE** National Cancer Institute  
at the National Institutes of Health | www.cancer.gov

## Breast Cancer Risk Assessment Tool

An interactive tool to help estimate a woman's risk of developing breast cancer



Last modified date: 05/16/2011

> **Get Started with the Risk Tool**

**About the Tool**

**Breast Cancer Risk Factors**

**Download Source Code**

**Page Options**

Print Page

**Quick Links**

[Breast Cancer Home Page](#)

[Breast Cancer: Prevention, Genetics, Causes](#)

[Current Clinical Trials: Breast Cancer In Situ, Treatment](#)

[Current Clinical Trials: Breast Cancer Prevention](#)

[Current Clinical Trials: Breast Cancer Screening](#)

[Breast Cancer Risk in American Women](#)

**Need Help?**

Contact us by phone, Web, and e-mail  
1-800-4-CANCER

The Breast Cancer Risk Assessment Tool is an interactive tool designed by scientists at the National Cancer Institute (NCI) and the [National Surgical Adjuvant Breast and Bowel Project \(NSABP\)](#) to estimate a woman's risk of developing [invasive breast cancer](#). See [About the Tool](#) for more information.

The Breast Cancer Risk Assessment Tool may be updated periodically as new data or research becomes available.

## Risk Tool

(Click a question number for a brief explanation, or [read all explanations](#).)

- Does the woman have a medical history of any breast cancer or of [ductal carcinoma in situ \(DCIS\)](#) or [lobular carcinoma in situ \(LCIS\)](#) or has she received previous radiation therapy to the chest for treatment of Hodgkin lymphoma?
- Does the woman have a mutation in either the [BRCA1](#) or [BRCA2](#) gene, or a diagnosis of a genetic syndrome that may be associated with elevated risk of breast cancer?
- What is the woman's age?  
*This tool only calculates risk for women 35 years of age or older.*
- What was the woman's age at the time of her first [menstrual period](#)?
- What was the woman's age at the time of her first live birth of a child?
- How many of the woman's first-degree relatives - mother, sisters, daughters - have had breast cancer?
- Has the woman ever had a breast [biopsy](#)? 
  - How many breast biopsies (positive or negative) has the woman had?
  - Has the woman had at least one breast biopsy with [atypical hyperplasia](#)?
- What is the woman's race/ethnicity?
- What is the sub race/ethnicity?

**NIH NATIONAL CANCER INSTITUTE**  
Breast Cancer Risk Assessment Tool

RISK CALCULATOR ABOUT THE CALCULATOR

1 Patient Eligibility 2 Demographics 3 Patient & Family History

### Patient Eligibility

Does the woman have a medical history of any breast cancer or of ductal carcinoma in situ (DCIS) or lobular carcinoma in situ (LCIS) or has she received previous radiation therapy to the chest for treatment of Hodgkin lymphoma?

Yes  
 No

Does the woman have a mutation in either the [BRCA1](#) or [BRCA2](#) gene, or a diagnosis of a genetic syndrome that may be associated with elevated risk of breast cancer?

Yes  
 No  
 Unknown

### Demographics

What is the patient's age?  
This tool calculates risk for women between the ages of 35 and 85.

Select age

What is the patient's race/ethnicity?

Select race

What is the sub race/ethnicity or place of birth?  
(Select only if you are of Hispanic or Latino ethnicity.)

Select

### Patient & Family History

Has the patient ever had a breast biopsy with a benign (not cancer) diagnosis?

Yes  
 No  
 Unknown

How many breast biopsies with a benign diagnosis has the patient had?

1  
 2 or more

Has the patient ever had a breast biopsy with atypical hyperplasia?

Yes  
 No  
 Unknown

What was the woman's age at the time of her first menstrual period?

7 to 11  
 12 to 13  
 14 or older

What was the woman's age when she gave birth to her first child?

Select

How many of the woman's first-degree relatives (mother, sisters, daughters) have had breast cancer?

None  
 One  
 More than one  
 Unknown

Calculate Risk  
Reset

### 5-Year Risk of Developing Breast Cancer

Patient Risk

**0.4%**



Average Risk

**0.4%**



Based on the information provided, the patient's estimated risk for developing invasive breast cancer over the next 5 years is 0.4%, presented in blue since hers is equal to the average risk of 0.4% (presented in blue) for women of the same age and race/ethnicity in the general U.S. population.

### Lifetime Risk of Developing Breast Cancer

Patient Risk

**9.8%**



Average Risk

**10%**

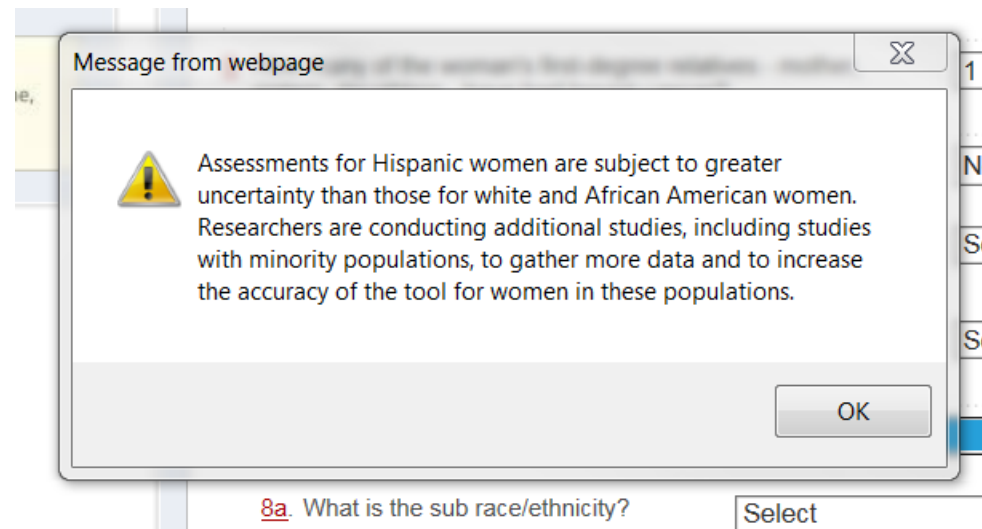


Based on the information provided, the woman's estimated risk for developing invasive breast cancer over her lifetime (to age 90) is 9.8%, presented in green since hers is lower than the average risk of 10% (presented in blue) for women of the same age and race/ethnicity in the general U.S. population.

# DISCLAIMER!!

## Race/Ethnicity:

The tool may underestimate risk for African American women with one or more biopsies.





# Risk Estimate Models and Race/Ethnicity

- Breast cancer genes found through volunteers
  - Volunteers gave blood samples and family histories (heavily Jewish)
  - BRCA 1 and 2 found in 1994 and 1995
- Risk estimate models are population-based tools
  - Most of the research was based on and validated in White women
  - More recently included women of other ethnicities
    - Gail model-82,109 White women; 3,254 African American women; 1,541 Asian women

# International Breast Cancer Intervention Study IBIS (Tyrrer-Cuzick)

- Age.
- Race/ethnicity.
- **Breast density.**
- Childbirth history.
- **Body mass index (BMI).**
- Previous breast biopsies.
- **History of ovarian cancer.**
- Family history of breast cancer.
- Menarche/Menopause
- **Use of hormone replacement therapy.**
- **Knowledge of having the *BRCA1* or *BRCA2* gene mutation**

# IBIS (Tyrer-Cuzick)

- <https://ibis-risk-calculator.magview.com>

The screenshot shows the top navigation bar of the MagView website with the logo on the left and five menu items: PERSONAL HISTORY, QUESTIONNAIRE, FAMILY HISTORY, YOUR RESULTS, and FAQ. Below the navigation is the title "Tyrer-Cuzick Risk Assessment Calculator". A paragraph explains that the calculator asks questions about personal and family history to determine the possibility of developing breast cancer. A warning states that the model is not intended for women already diagnosed with breast cancer. A box for clinical users notes that the calculator is for non-commercial use and requires a license.

## Assess Breast Cancer Risk

What is your current age?

years old

System Of Measurement

Metric Units  Imperial Units

What is your current height and weight?

Height  (ft)  (in)      Weight  (lb)

Have you ever had a menstrual period?

Yes  No

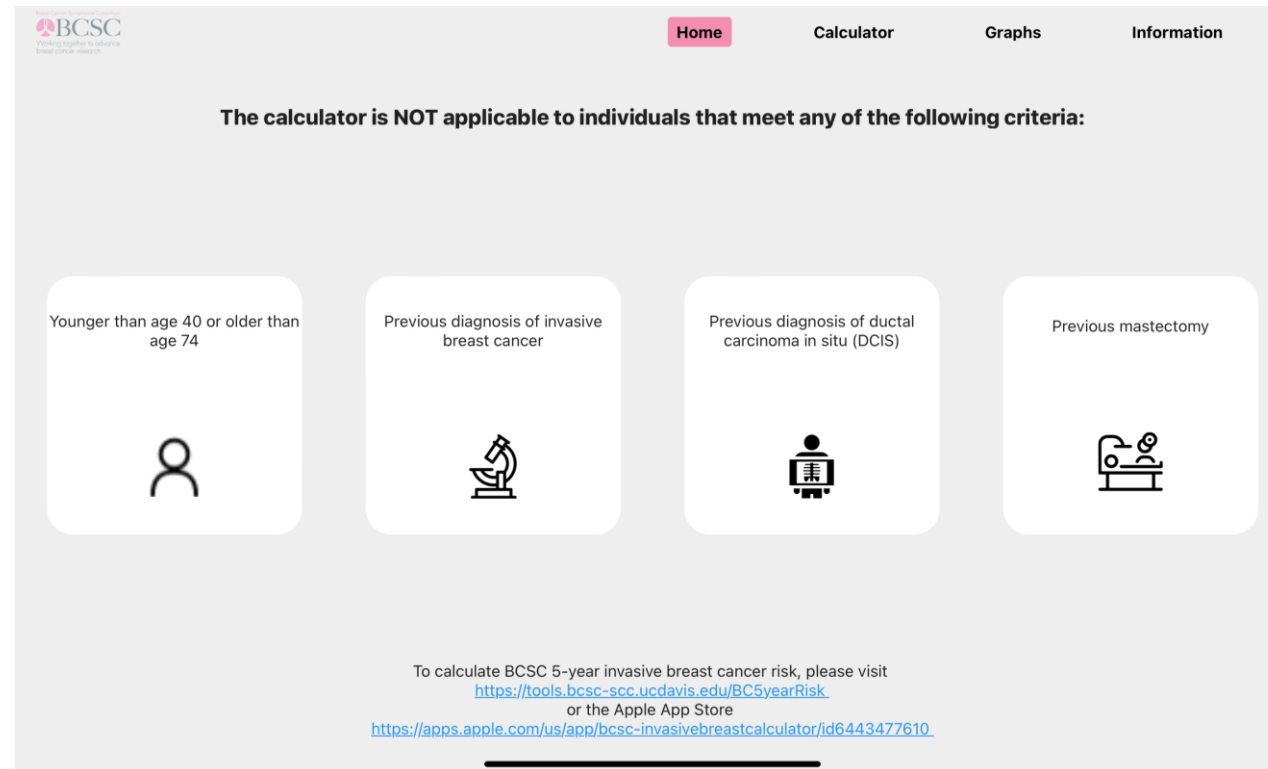
NEXT

[Having Trouble? Report an Issue](#)

[Frequently Asked Questions](#)


# Breast Cancer Surveillance Consortium (BCSC)

- Determines risk of breast cancer in 5 years or [metastatic breast cancer in 6 years](#)
- <https://tools.bcsc-scc.ucdavis.edu/AdvBC6yearRisk/#/>



The screenshot shows the BCSC website interface. At the top left is the BCSC logo with the tagline "Working together to advance breast cancer research". To the right are navigation links: "Home" (highlighted in pink), "Calculator", "Graphs", and "Information". Below the navigation is a warning message: "The calculator is NOT applicable to individuals that meet any of the following criteria:". This message is followed by four white rounded rectangular boxes, each containing a criterion and an icon: 1. "Younger than age 40 or older than age 74" with a person icon. 2. "Previous diagnosis of invasive breast cancer" with a microscope icon. 3. "Previous diagnosis of ductal carcinoma in situ (DCIS)" with a person and a computer monitor icon. 4. "Previous mastectomy" with a person and a breast icon. At the bottom of the page, there is a note: "To calculate BCSC 5-year invasive breast cancer risk, please visit <https://tools.bcsc-scc.ucdavis.edu/BC5yearRisk> or the Apple App Store <https://apps.apple.com/us/app/bcsc-invasivebreastcalculator/id6443477610>".

# Breast Cancer Surveillance Consortium (BCSC)

 Home **Calculator** Graphs Information

**BCSC Advanced Breast Cancer Risk Calculator Version 1.** Start Over

Does the individual have a personal history of breast cancer, lobular carcinoma in situ, ductal carcinoma in situ, or mastectomy? i

What is the individual's age? i

What is the individual's race/ethnicity? i

Have any of the individual's first-degree relatives (mother, sister or daughter) been diagnosed with breast cancer? i

Has the individual had prior breast biopsies? i

What is the individual's BI-RADS breast density? i

# BRCAPRO

- Predicts likelihood of having BRCA1 or BRCA2 mutation
- Considers detailed family history
- Considers history of breast or ovarian cancer related surgery

<https://projects.iq.harvard.edu/bayesmendel/brcapro>

# BOADICEA

- Breast and Ovarian Analysis of Disease Incidence and Carrier Estimation Algorithm (BOADICEA)
- Estimates risk for breast and ovarian cancer
- Considers family history
- Available via CanRisk website

<https://canrisk.org>


The screenshot shows the CanRisk website homepage. At the top, there is a dark blue navigation bar with language options (en, fr, nl, de, es, pt, it) on the left and 'Home', 'About', and 'Login or Register' on the right. The main content area has a light blue background. The heading 'What is CanRisk?' is accompanied by a calculator icon. Below it, a paragraph describes CanRisk as an online tool for calculating cancer risks based on family history, genetic factors, and other risk factors. To the right is the CanRisk logo. Below the main content are three white boxes with icons: 'What does CanRisk do?' with a line graph icon, 'Who is CanRisk for?' with a person icon, and 'Endorsements' with a checkmark icon. The 'Endorsements' box lists NICE, UK Cancer Genetics Group, and Ontario Breast Screening.

en fr nl de es pt it

Home About Login or Register

## What is CanRisk?

CanRisk is an online tool that enables healthcare professionals to calculate an individual's future risks of developing *breast and ovarian cancer* using cancer family history, genetic and other risk factors. CanRisk also calculates mutation carrier probabilities in breast and ovarian cancer susceptibility genes.



### What does CanRisk do?

CanRisk uses the **BOADICEA v6** model to calculate breast and ovarian cancer risks based on information entered for the individual which can include personal risk factors, cancer

### Who is CanRisk for?

CanRisk is designed for use by healthcare professionals to help them communicate and discuss breast and ovarian cancer risk with their patients.

### Endorsements

- NICE | The National Institute for Health and Care Excellence
  - [Breast Cancer](#)
  - [Ovarian Cancer](#)
- [UK Cancer Genetics Group guidelines](#)
- [Ontario Breast Screening](#)

# Black Women's Health Study (BWHS)

- Specifically for Black women

<https://www.bu.edu/slone/bwhs-brcarisk-calculator/>



[About](#) [Research](#) [Brown Bag Seminar](#) [Slone Drug Dictionary™](#) [BWHS Breast Cancer Risk Calculator](#) [Contact Us](#)



## BWHS Breast Cancer Risk Calculator

This BWHS (Black Women's Health Study) Breast Cancer Risk Calculator allows health professionals to estimate a woman's risk of developing invasive breast cancer over the next 5 years. It was derived and tested solely in data from U.S. Black women. The tool uses a woman's personal medical and reproductive history and the history of breast cancer and prostate cancer among her first-degree relatives (parents, siblings, children) to estimate absolute breast cancer risk—her chance or probability of developing breast cancer in a given period of time.

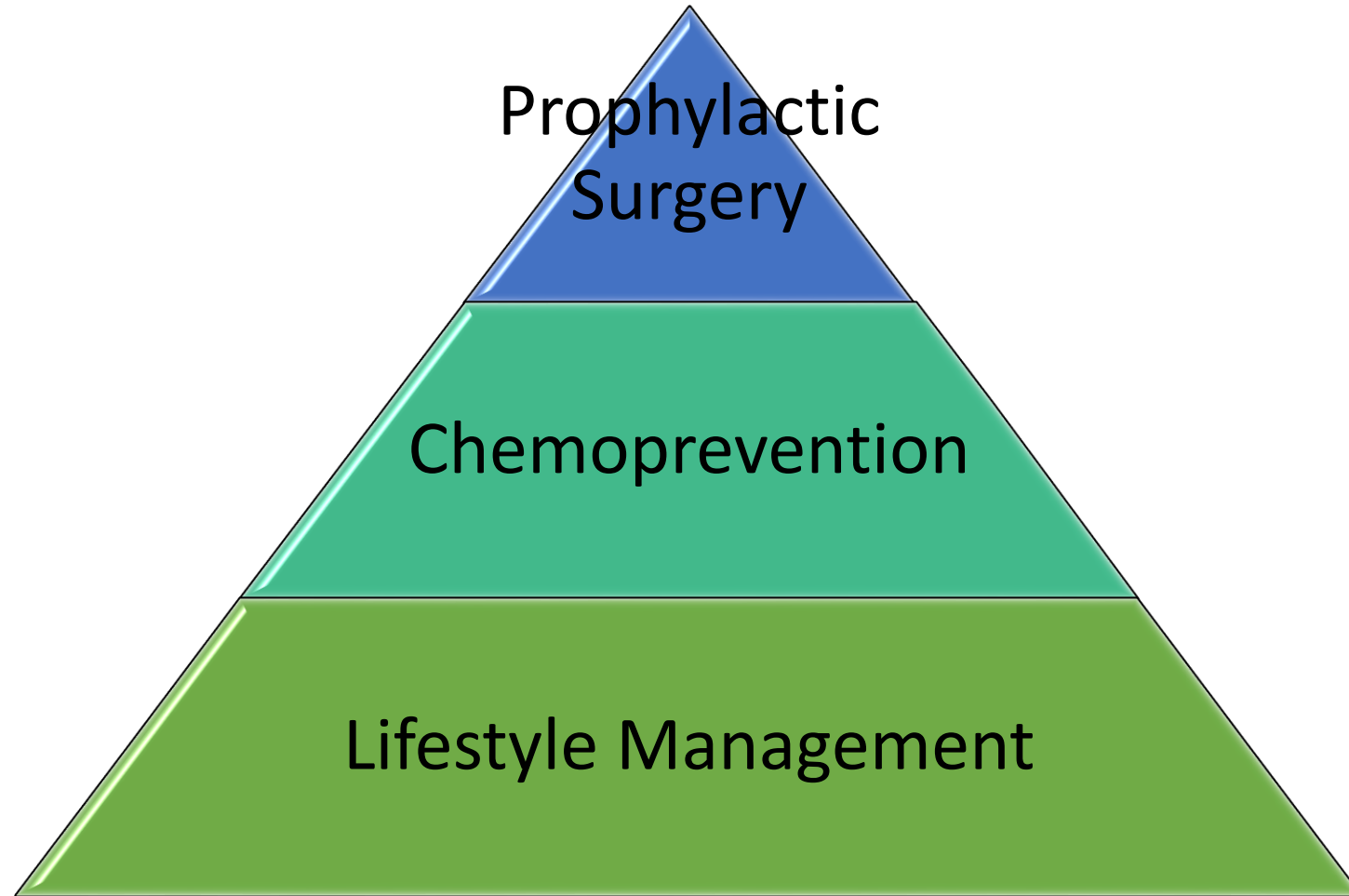
Although a woman's risk may be accurately estimated, these predictions do not allow one to say precisely which woman will develop breast cancer. In fact, some women who do not develop breast cancer have higher risk estimates than some women who do develop breast cancer.

### Risk prediction model for breast cancer in U.S. Black women

Age (This tool is useful only for women ages 30 - 70)



# Strategies to Mitigate Risk



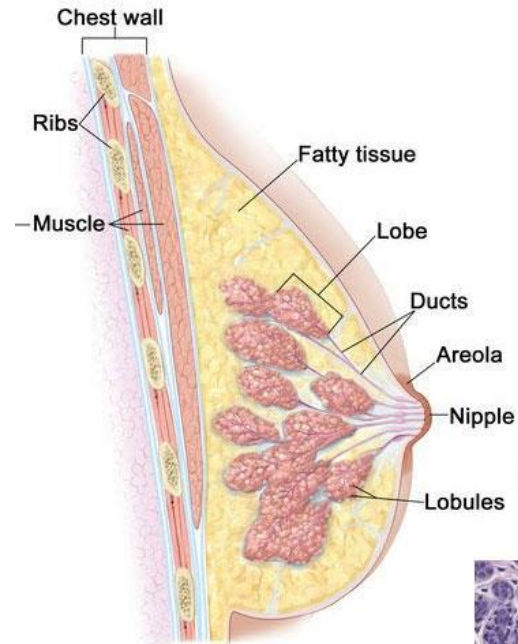
# Screening Modalities



# Breast Anatomy

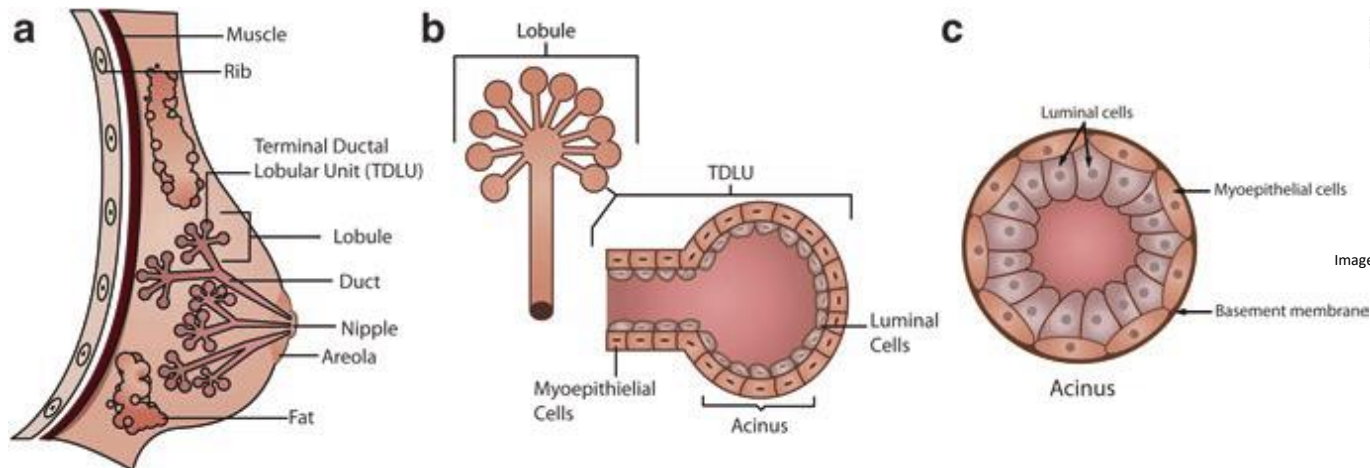
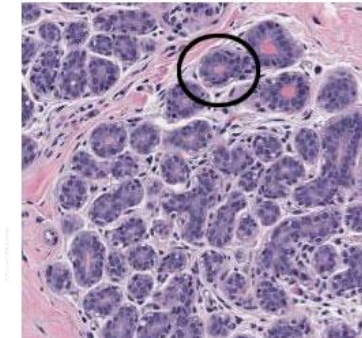
- Consists of 15-20 lobes embedded within connective tissue
- Adipose tissue fills the space between the lobes
- Each of the lobes contains lobules, which produce milk
- Lobes are connected by milk ducts, which connect to the nipple surface
- Extracellular fluid drains through axillary and internal mammary lymph nodes
- The majority of cancers arise in either the ducts or the lobes, not the surrounding stroma or fat

## Anatomy of the Female Breast



© 2012 Terese Winslow LLC, U.S. Govt. has certain rights

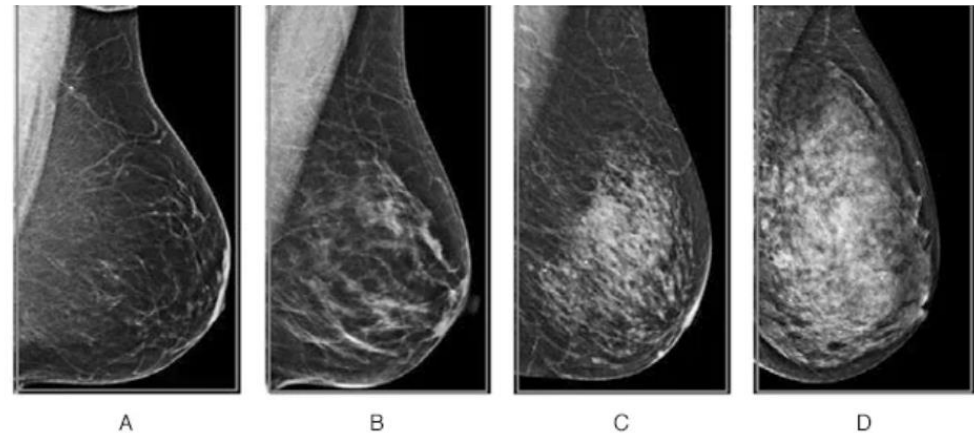
An acinus (circled in black) is an epithelial substructure found in lobules.



Images courtesy of dceg.cancer.gov and google search

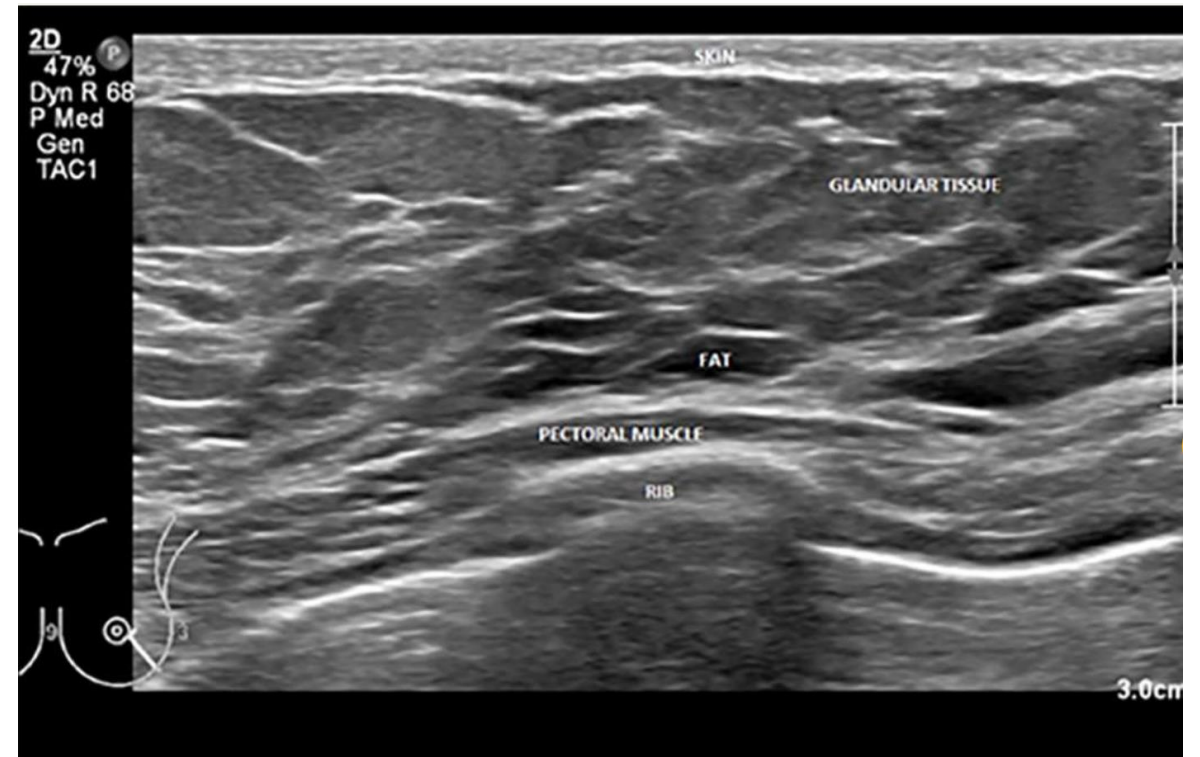
# Mammogram

- Radiation dose
  - 3 mGy per breast
  - Lifetime exposure 0.2-0.4 Gy
- Three positions-craniocaudad, mediolateral, mediolateral oblique
- Detects abnormalities:
  - Calcifications
  - Changes in density
- Digital Mammography vs. Digital Breast Tomosynthesis (3D Mammography)



# Ultrasound

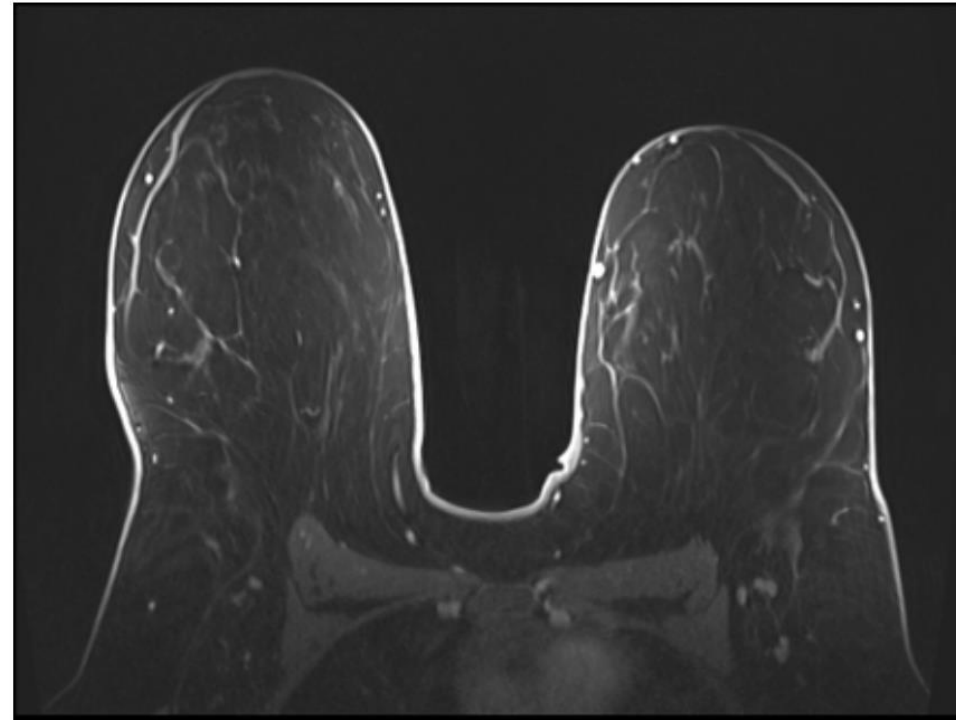
- Mass
- Mammographic abnormalities
- Nipple Discharge
- Pain
- Dense breast tissue
- Lymph node evaluation



Images courtesy of uclahealth.org

# MRI

- High risk patients
- Discordant imaging and physical exam findings
- High risk lesions (atypia) with family history
- Pre-operative workup for cancer evaluation
  - Guide surgery and radiation oncology management



Axial T1 C+ fat sat

Image courtesy of radiopaedia.org

# Advances in Screening Modalities



# Advances in Screening Modalities

## ▪ Mammogram

### ○ Digital Breast Tomosynthesis (3D Mammogram)

- Provides clearer images in women with dense breast tissue
- Identifies smaller tumors
- Approximately double the radiation exposure

### ○ AI reading

- Similar cancer detection rate, lower workload burden

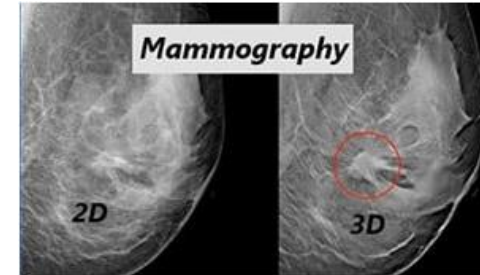


Image courtesy of Moffitt Cancer Center

## ▪ Ultrasound

### ○ High frequency transducers, 3D US, contrast enhanced, elastography, automated

## ▪ Abbreviated-MRI

[https://www.foxchase.org/blog/facts-about-2d-and-3d-mammograms#:~:text=During%20a%202D%20mammogram%20\(also,the%20breast%20from%20different%20angles.](https://www.foxchase.org/blog/facts-about-2d-and-3d-mammograms#:~:text=During%20a%202D%20mammogram%20(also,the%20breast%20from%20different%20angles.)

Lång K, Josefsson V, Larsson AM, Larsson S, Högberg C, Sartor H, Hofvind S, Andersson I, Rosso A. Artificial intelligence-supported screen reading versus standard double reading in the Mammography Screening with Artificial Intelligence trial (MASAI): a clinical safety analysis of a randomised, controlled, non-inferiority, single-blinded, screening accuracy study. *Lancet Oncol.* 2023 Aug;24(8):936-944. doi: 10.1016/S1470-2045(23)00298-X. PMID: 37541274.

Catalano O, Fusco R, De Muzio F, Simonetti I, Palumbo P, Bruno F, Borgheresi A, Agostini A, Gabelloni M, Varelli C, Barile A, Giovagnoni A, Gandolfo N, Miele V, Granata V. Recent Advances in Ultrasound Breast Imaging: From Industry to Clinical Practice. *Diagnostics (Basel).* 2023 Mar 4;13(5):980. doi: 10.3390/diagnostics13050980. PMID: 36900124; PMCID: PMC10000574.

Patel S, Heacock L, Gao Y, Elias K, Moy L, Heller S. Advances in Abbreviated Breast MRI and Ultrafast Imaging. *Semin Roentgenol.* 2022 Apr;57(2):145-148. doi: 10.1053/j.ro.2022.01.004. Epub 2022 Jan 23. PMID: 35523528.



# Barriers to Screening



# Screening Prevalence

**Table 5. Mammography (%), Women 45 and Older, US, 2019**

	Up-to-date* (≥ 45 years)	Within the past 2 years (50-74 years)
<b>Overall</b>	<b>65</b>	<b>76</b>
<b>Age (years)</b>		
45-54	54	–
55-64	76	–
65-74	78	78
75+	54	–
<b>Race/Ethnicity</b>		
Hispanic/Latina	67	79
White	65	76
Black	69	79
Asian/Pacific Islander	60	74
American Indian/Alaska Native	54	63
<b>Education</b>		
Some high school or less	57	69
High school diploma or GED	61	73
Some college/Assoc. degree	66	76
College graduate	72	83
<b>Sexual orientation</b>		
Gay/Lesbian	57	74
Straight	66	77
Bisexual	65	†
<b>Health insurance status (age ≤64 years)</b>		
Uninsured (ages < 65 years)	36	44
Private	70	80
Medicaid/pub/dual	61	72
Medicare (ages ≥65 years)	68	78
Other	69	79

## Immigration

Born in US/US Territory	65	77
In US fewer than 10 years	47	59
In US 10 or more years	67	78

## Region

Northeast	68	81
Midwest	66	76
South	64	75
West	65	75

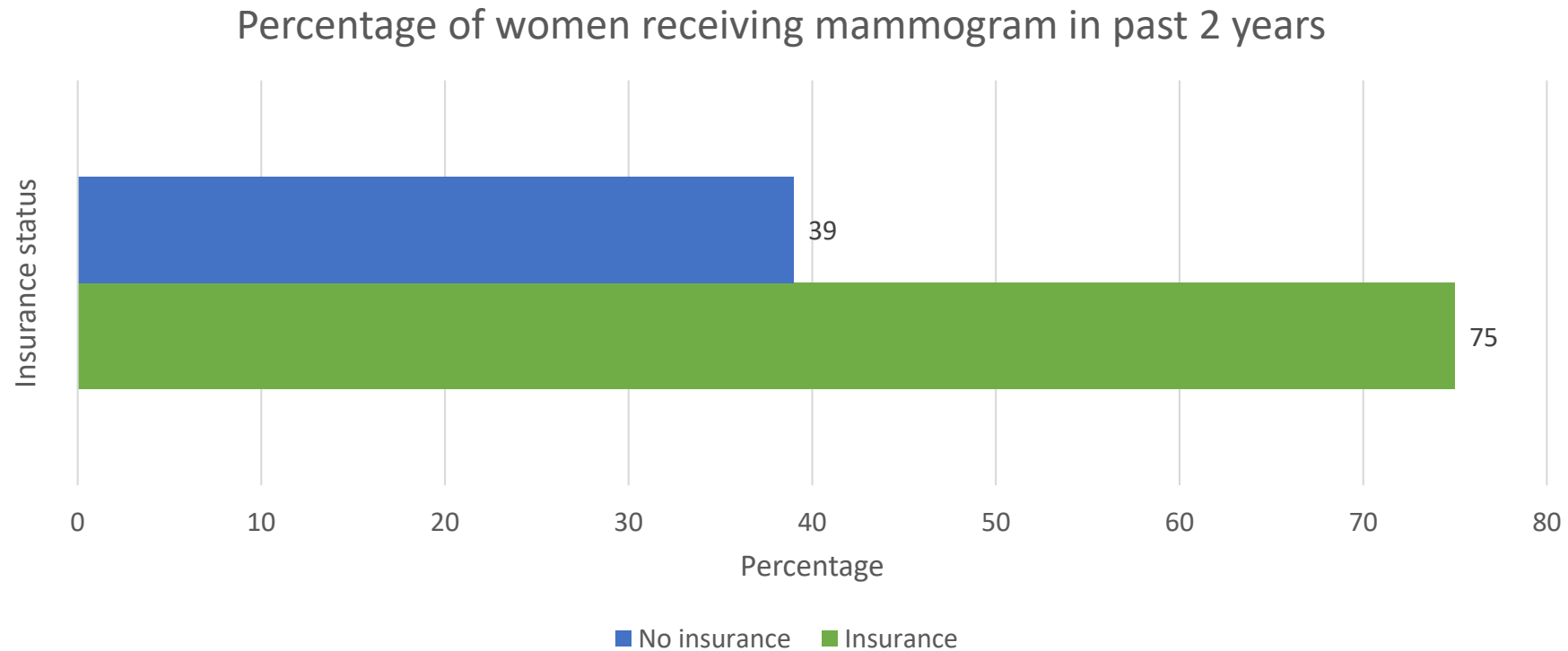
GED = General Educational Development high school equivalency. \*According to the American Cancer Society recommendations: mammogram within the past year (ages 45-54 years) or past two years (ages ≥55 years). †Estimate not provided due to instability. Note: Race is exclusive of Hispanic origin. Mammography prevalence estimates do not distinguish between examinations for screening and diagnosis.

**Source:** National Health Interview Survey, 2019.

©2022, American Cancer Society, Inc., Surveillance and Health Equity Science

- Overall rate of adherence to screening is 65-76%
- Asian women with reportedly the lowest screening rates
- Uninsured population with the lowest mammogram screening rates of any group

# Disparities in Mammogram Utilization



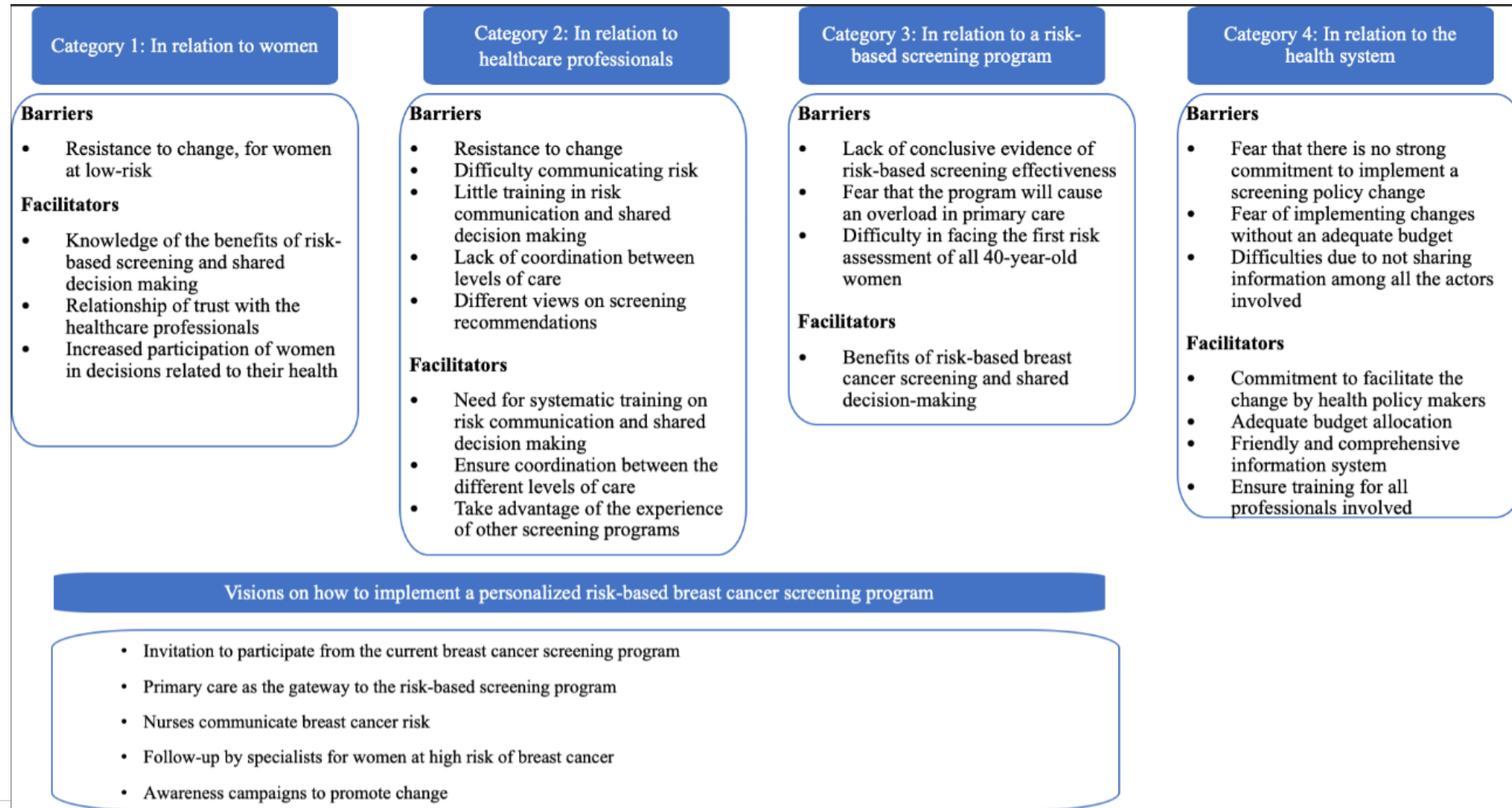
Courtesy of komen.org

# Barriers to Screening Completion

- Insurance
- Cost
- Transportation
- Work (lack of paid time off)
- Childcare needs
- Fear
- Language

Castaldi, M., Smiley, A., Kechejian, K. *et al.* Disparate access to breast cancer screening and treatment. *BMC Women's Health* **22**, 249 (2022). <https://doi.org/10.1186/s12905-022-01793-z>

# Barriers to Adoption of Screening Recommendations



# Solutions to Overcome Barriers



# Methods to Overcome Barriers

- Improving access to mammography and primary care
- Removing financial barriers
- Removing language barriers
- Community education (such as health campaigns that address negative beliefs and feelings about mammography)
- Making sure health care providers are sensitive to the needs of women from different communities and cultures. When a provider doesn't recommend a mammogram, some women don't feel they need one.

[Komen.org](https://www.komen.org)

# Addressing Cost



- National Breast and Cervical Cancer Early Detection Program

- Health insurance does not fully cover screening tests
- Annual income below 250 percent of the federal poverty level
- Between 40 and 64 years of age

<https://www.cdc.gov/breast-cervical-cancer-screening/index.html>

- Every Woman Counts [\(800\) 511-2300](tel:8005112300)

- Are a women 40 years old or older, you may qualify for routine breast cancer screenings
- Have symptoms of at any age, regardless of gender, you may qualify for breast diagnostic services

- Health Services Los Angeles County

<https://dhs.lacounty.gov/womens-health/our-services/womens-health/cancer-screening/>



# Addressing Social Barriers

**Figure 4**  
**CHW Roles and Activities**

Build relationships  
with community



Provide  
information



Promote screening  
and follow-up care



Identify and  
address barriers



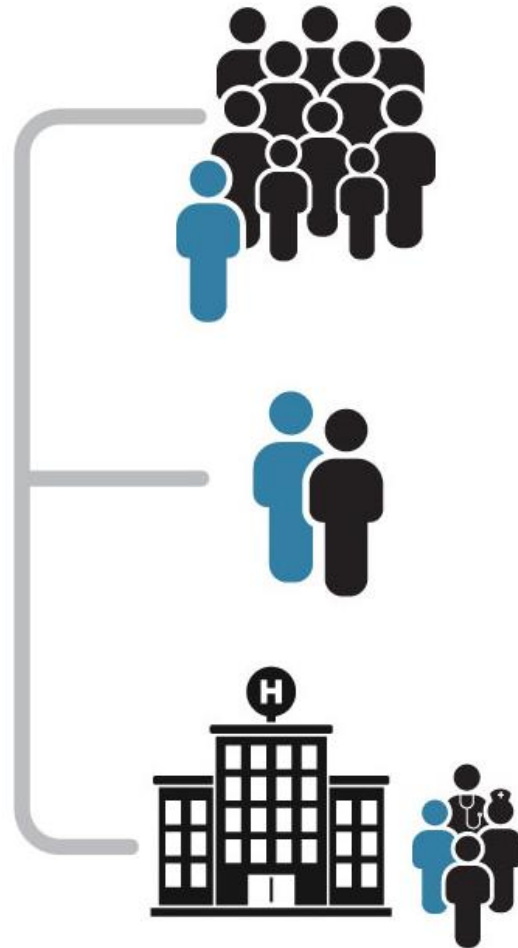
Facilitate access  
to resources  
and services



Coordinate care



Advocate for  
communities



- Community Health Workers (CHW) help reduce access barriers
- Practice specific solutions based on need

<https://prescancerpanel.cancer.gov/report/cancerscreening/Part2Goal2.html>

# Solutions to Screening Barriers

Figure 2

## President's Cancer Panel Goals and Recommendations



<https://prescancerpanel.cancer.gov/report/cancerscreening/Part2Goal2.html>

# Summary

Starting at age 25, have a formal assessment for risk of breast cancer

Average risk for breast cancer

- Yearly mammograms starting at age 40
- May need supplemental imaging if you have dense breasts
- No age cutoff for having mammograms

High risk for breast cancer

- Gene mutation, radiation as a child
  - MRI starting at age 25
  - Mammograms starting at age 30
- Strong family history, lifetime risk >20%
  - Yearly mammograms and MRI starting at age 35

- Multiple barriers exist to provide appropriate screening for average- and high-risk women
- Solutions will depend on your practice type and patient population

# Frequently Asked Questions

1. As of 2024, at what age does the United States Preventive Service Task Force (USPSTF) recommend starting mammograms for women at average risk for breast cancer?

- A. 50
- B. 45
- C. 40**
- D. 35

2. According to the National Comprehensive Cancer Network, which of the following traits does not qualify an individual for increased risk screening with MRI?

- A. Individual with risk calculator determining 15% lifetime risk of breast cancer**
- B. Individual who has not received genetic testing but has a first degree relative with BRCA1 mutation
- C. Individual with thoracic radiation at the age of 15

# Frequently Asked Questions

3. In 2021, which of the following groups has the reported lowest rates of breast cancer screening?

- A. Non-Hispanic White women
- B. Non-Hispanic Black women
- C. Asian women
- D. Hispanic women

4. Which of the following patient demographics is the most strongly associated with lower rates of screening mammogram use?

- A. Race
- B. Insurance status
- C. Education level

# Resources

## [SAFE BEAUTY PRODUCT LIST](#)

<https://www.bench2community.org/resources>

<https://www.ewg.org/skindeep/>

## [RISK ASSESSMENT TOOLS](#)

<https://bcrisktool.cancer.gov>

<https://ibis-risk-calculator.magview.com>

<https://tools.bcsc-scc.ucdavis.edu/AdvBC6yearRisk/#/>

<https://projects.iq.harvard.edu/bayesmendel/brcapro>

<https://canrisk.org>

<https://www.bu.edu/slone/bwhs-brcarisk-calculator/>

## [NO OR LOW COST SCREENING MAMMOGRAM](#)

<https://www.cdc.gov/breast-cervical-cancer-screening/index.html>

[\(800\) 511-2300](tel:(800)511-2300)

<https://dhs.lacounty.gov/womens-health/our-services/womens-health/cancer-screening/>

# Thank you!

Veronica Jones | [vjones@coh.org](mailto:vjones@coh.org)

