BREAST CANCER 101

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OUTLINE

1. What is breast cancer?
2. What is my risk of breast cancer?
3. How is breast cancer diagnosed?
4. What are the types and stages of breast cancer?
5. How is breast cancer treated?

WHAT IS BREAST CANCER?

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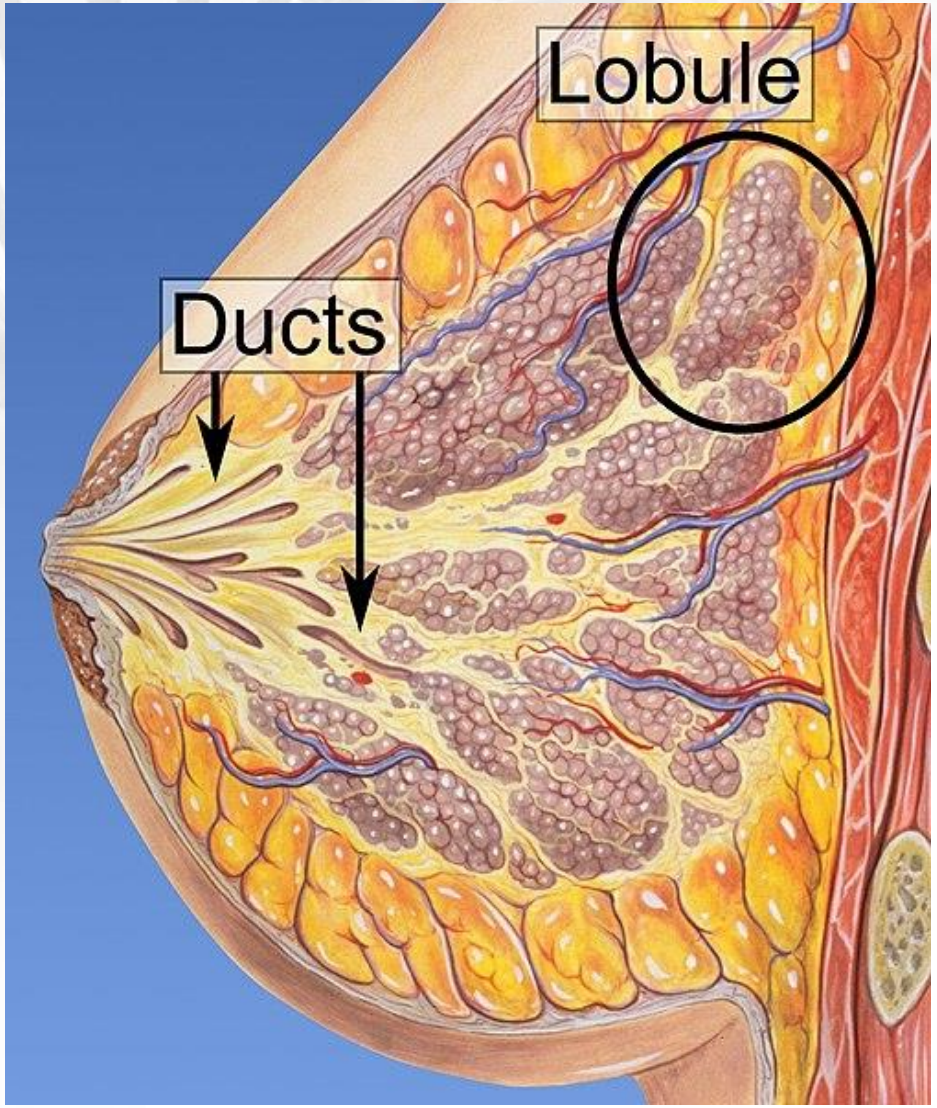
WHAT IS BREAST CANCER?

A group of diseases in which cells in a person's breast tissue change and divide uncontrolled

Most breast cancers begin in the milk glands (lobules) or in the tubes (ducts) that connect the milk glands to the nipple



https://upload.wikimedia.org/wikipedia/commons/4/47/Lobules_and_ducts_of_the_breast.jpg

American Cancer Society. Breast Cancer Facts & Figures 2022-2024.

WHAT IS MY RISK OF BREAST CANCER?

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BREAST CANCER FACTS AND STATISTICS

Breast cancer is the most commonly diagnosed cancer in women

The numbers:

- **Worldwide**: Every year, more than 1.8 million new cases of breast cancer and more than 464,000 breast cancer deaths in women
  - **United States**: 287,850 new cases of breast cancer estimated in 2022, and 43,250 breast cancer deaths
    - **Georgia**: 9,440 new cases of breast cancer estimated in 2023, and 1,400 breast cancer deaths

JAMA Oncol. 2015 Jul;1(4):505-27.
American Cancer Society. Breast Cancer Facts & Figures 2022-2024.

BREAST CANCER FACTS AND STATISTICS

Approximately 13% of women will be diagnosed with breast cancer sometime in their life

- Most frequently diagnosed between 55-64

About 3% of women will die from breast cancer

But, some hope on the horizon:

- Breast cancer death rates declined 36% from 1989-2012 due to improvements in early detection and treatment
- 91% of women now survive 5 years after diagnosis
- Over 4 women living with breast cancer in the US in 2022

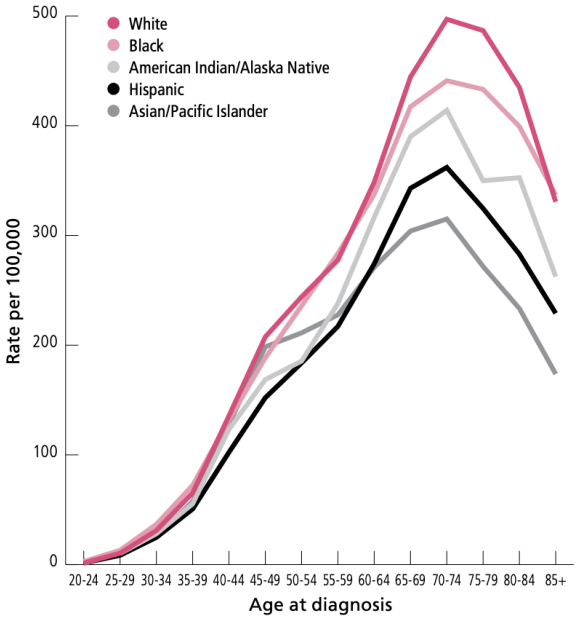
CA Cancer J Clin. 2016;66(1):7.
American Cancer Society. Breast Cancer Facts & Figures

FACTORS THAT INCREASE BREAST CANCER RISK

History of certain pre-cancerous lesions
BRCA1/BRCA2 (and other) gene mutations
Close relatives with breast cancer
Increasing age
Exposure to radiation at a young age (10-14y)

Obesity (in postmenopausal women)
Early menarche (<11y), late menopause (≥55y)
Older age at birth of first child (>30y)
Excessive alcohol use
Dense breast tissue
Long-term use of hormone replacement therapy
Type 2 diabetes
Recent hormonal birth control pill use
(risk returns to baseline after 10 years)

Figure 2. Age-specific Female Breast Cancer Incidence Rates by Race/Ethnicity, US, 2015-2019



Note: Rates are per 100,000 and age adjusted to the 2000 US standard population. 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.

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)
Lifetime risk	**12.9% (1 in 8)**	**2.5% (1 in 39)**

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

American Cancer Society. Breast Cancer Facts & Figures

FACTORS THAT MAY REDUCE BREAST CANCER RISK

Breastfeeding

- For each year of breast feeding there is a ~4.3% decrease in breast cancer risk

Physical activity (especially in postmenopausal women)

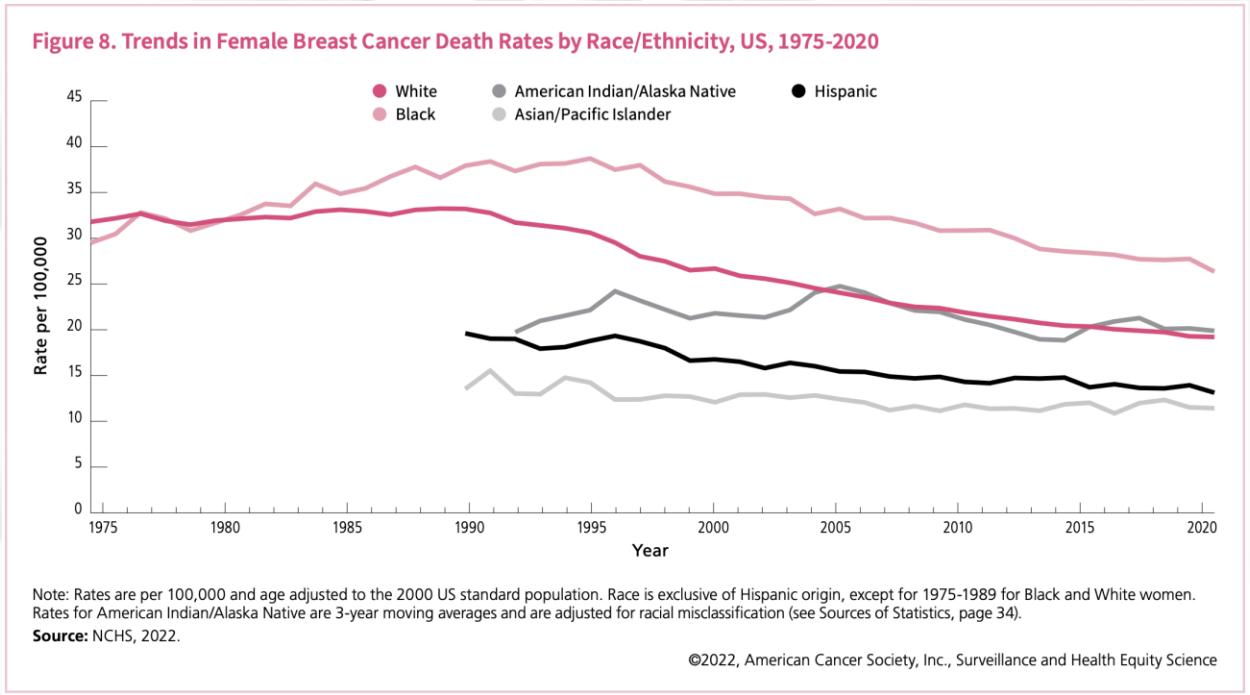
- May work by reducing levels of circulating estrogen in the blood
- Can lower risk of breast cancer by 10-20%

Not enough data to show that dietary factors (fat intake, red meat intake…) or supplements (vitamin D, antioxidants…) play a positive or negative role, but more research is being done to look into this

Lancet. 2002;360(9328):187.

RACIAL/ETHNIC DISPARITIES IN BREAST CANCER

- Black and Native American women have a lower incidence of breast cancer than white women in the US, but their mortality is higher
- Black, Hispanic, Asian/Pacific Islander, and Native American women are diagnosed at younger age on average compared to white women
- Fewer breast cancers are diagnosed at a localized (curable) stage in Black women than in white women
- 5-year relative survival rate for breast cancer diagnosed 2002-2008 was 78% in Black women compared to 90% among white women



J Clin Oncol. 2015 Nov;33(31):3621-7. CA Cancer J Clin. 2011; 61 (4): 212. American Cancer Society. Breast Cancer Facts & Figures

RACIAL/ETHNIC DISPARITIES IN BREAST CANCER

Why do these disparities exist?

1) **Tumor biology**

-Black women are more likely to be diagnosed with more aggressive forms of breast cancer ('triple negative') and to be diagnosed at a younger age

-Black women with triple negative breast cancer may have even more aggressive features than white women with triple negative disease

2) **Socioeconomic factors**

-Black women are less likely to see primary care doctors regularly compared with white women, and are less likely to undergo breast cancer screening

-Once a breast cancer diagnosis is made, Black women have a significantly longer delay to the start of treatment

J Clin Oncol. 2015 Nov;33(31):3621-7. CA Cancer J Clin. 2011; 61 (4): 212.

HOW IS BREAST CANCER DIAGNOSED?

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SIGNS AND SYMPTOMS

More common:

- Painless mass in breast
- Fullness under an arm

Less common:

- Dimpling of the skin (peau d'orange) with underlying thickening, swelling, or redness
- Breast pain or heaviness
- Nipple changes: spontaneous discharge (especially if bloody), scaliness, or retraction

Many times, breast cancer is asymptomatic and found on screening imaging at an early stage

- Earlier-stage cancers have higher rates of cure
- Studies show that being screened for breast cancer lowers the chance that a woman will die of the disease

Emerg Radiol. 2022 Feb;29(1):207-213.

American Cancer Society. Breast Cancer Facts & Figures 2022-2024.

DIAGNOSING BREAST CANCER

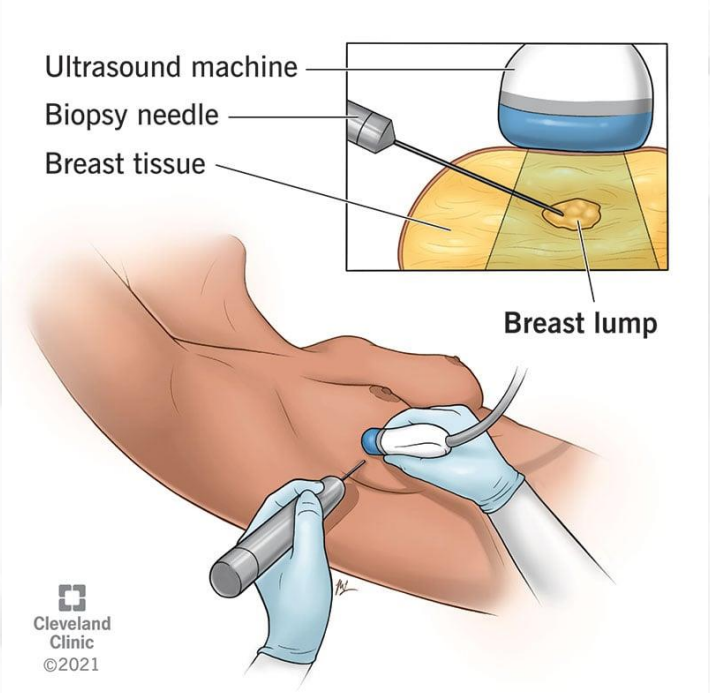
Mammogram (screening vs diagnostic)

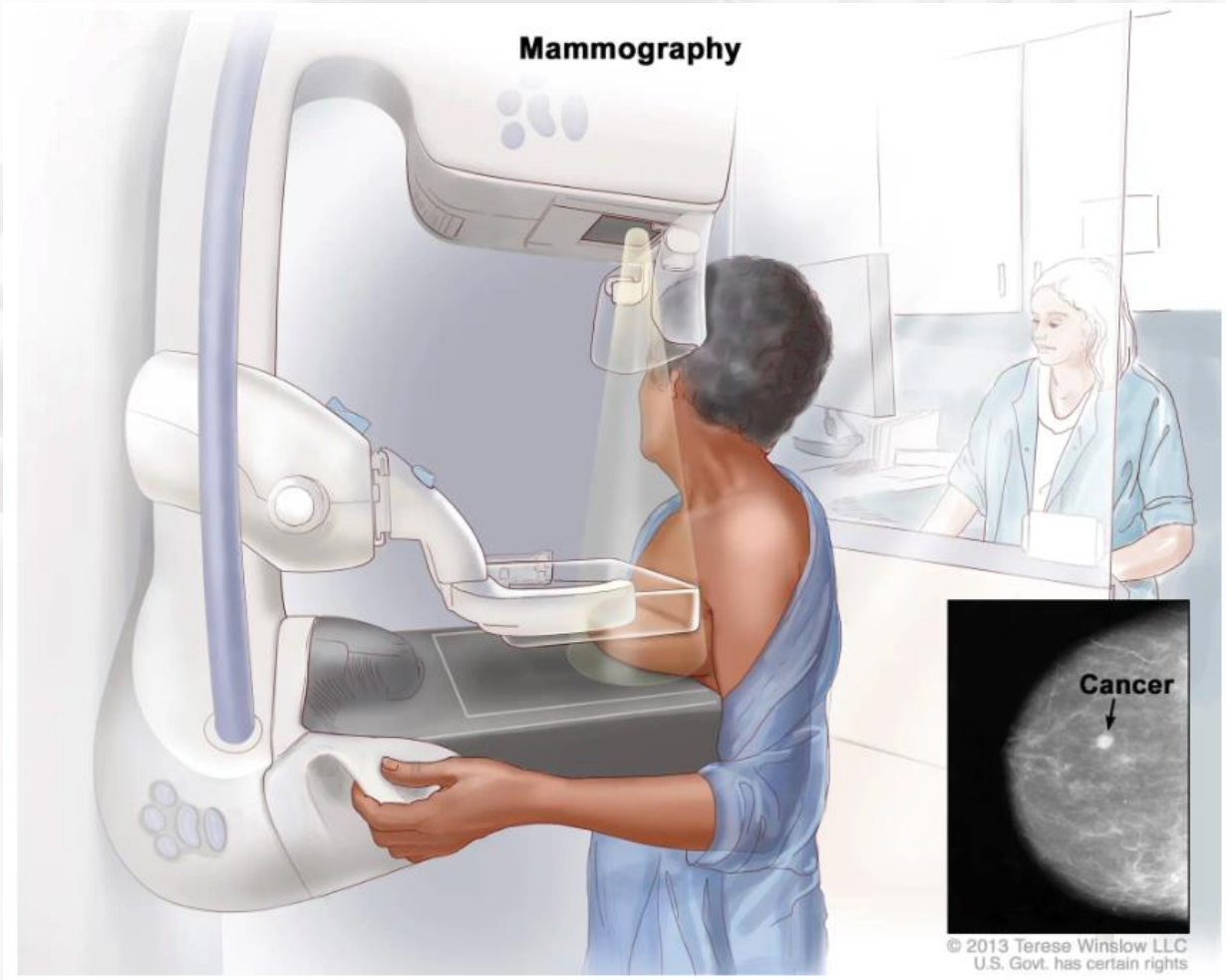
- Looking for calcifications, asymmetry
- Dense breast tissue can make it harder to see smaller cancers

Ultrasound

Biopsy (usually with a needle)

Sometimes needed: Breast MRI, CT, bone scan, PET/CT





https://www.facs.org/for-patients/home-skills-for-patients/breast-cancer-surgery/preoperative-tests-and-imaging/mammography/

WHAT ARE THE TYPES AND STAGES OF BREAST CANCER?

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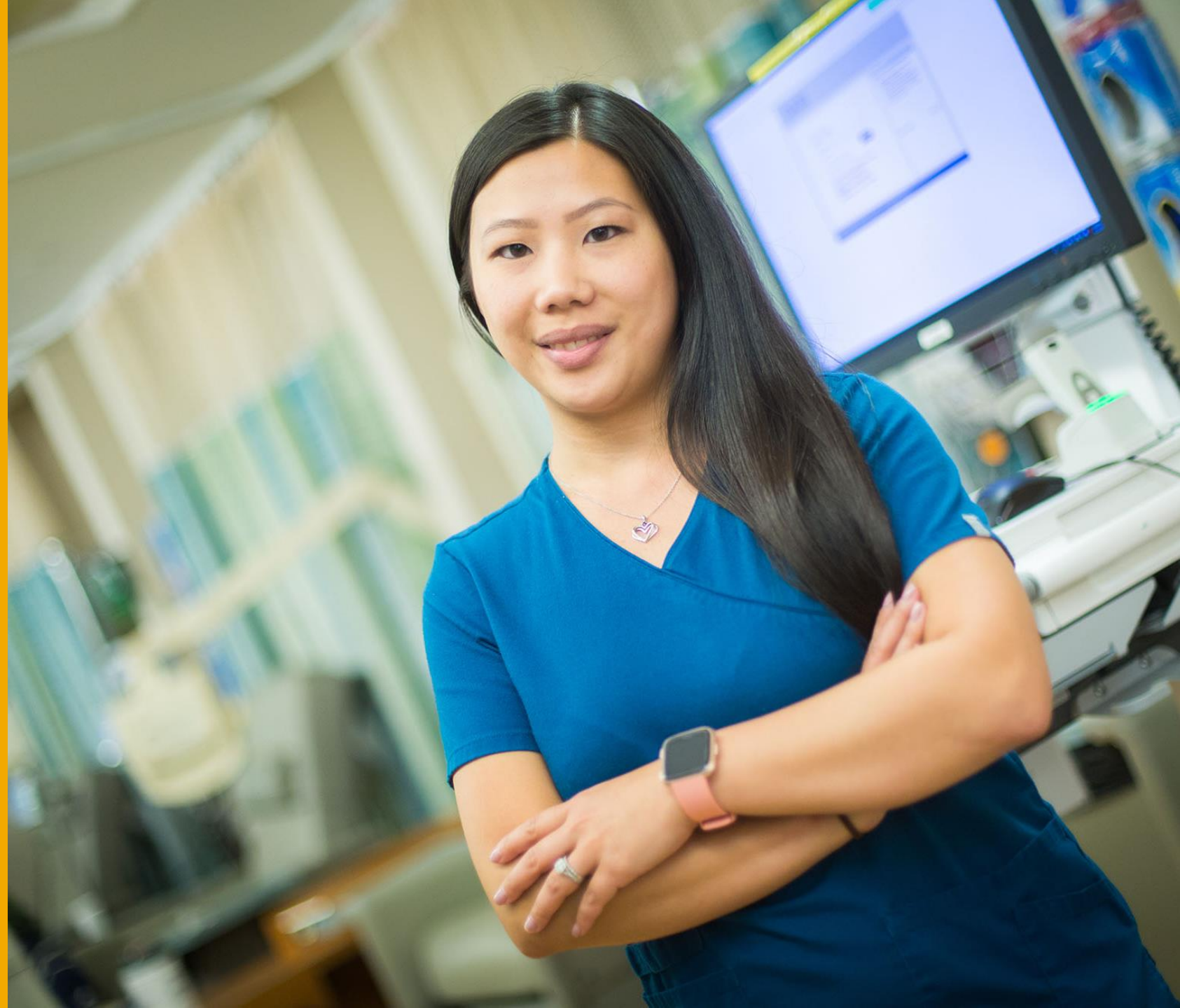


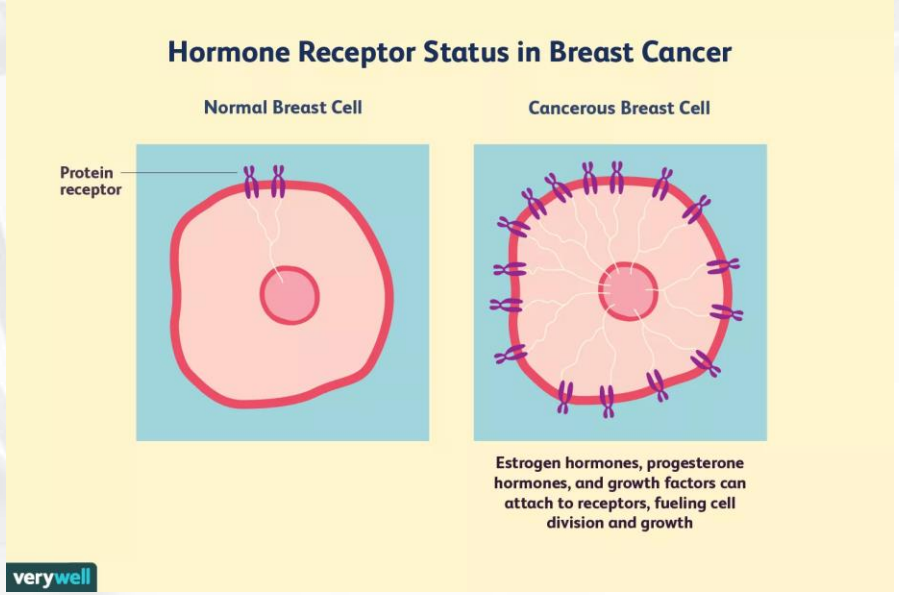
BREAST CANCER SUBTYPES

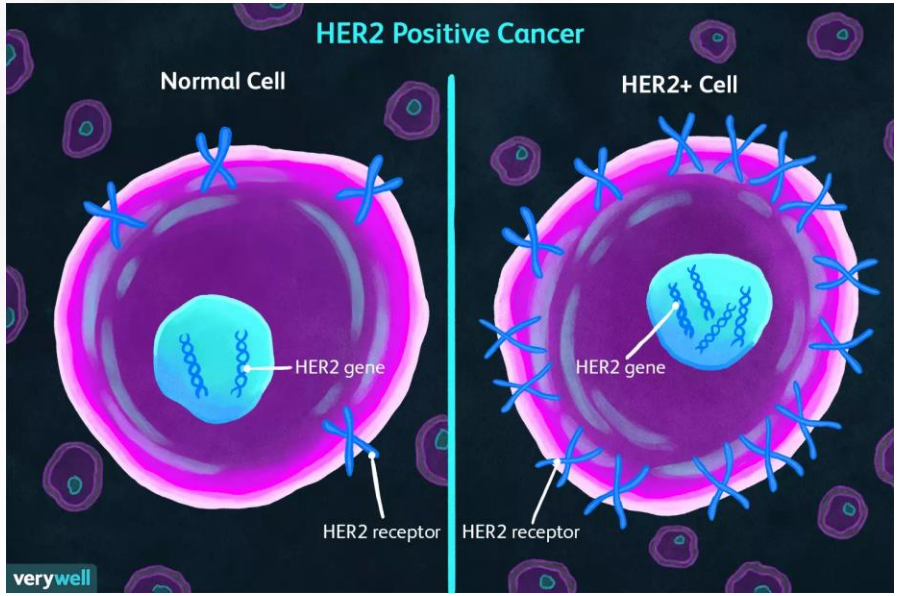
Estrogen receptor (ER)
Progesterone receptor (PR)
Human epidermal growth factor 2 (HER2)

"Hormone receptors" (HR)

HR+/HER2- = 68% of US breast cancers
HR+/HER2+ = 10%
ER-/PR-/HER2- (triple negative) = 10%
HR-/HER2+ = 4%

Triple negative breast cancer and HER2+ breast cancer are more likely to spread (metastasize) to lungs, liver, and brain





BREAST CANCER STAGING

Range from stage 0 (DCIS) to stage 4 (metastatic)

Clinical staging → BEFORE surgery

Pathologic staging → AFTER surgery

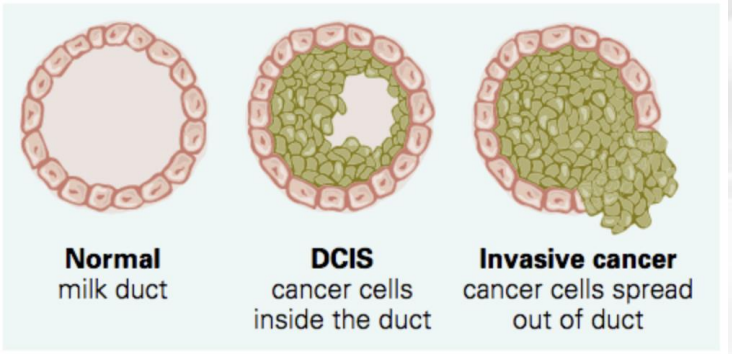
We use multiple pieces of information about the cancer to determine the stage:

- Tumor size
- Spread to nearby lymph nodes
- Spread to distant organs (metastasis)
- ER/PR/HER2 status
- Grade of cancer (appearance under the microscope)
- OncotypeDX recurrence score (when ER+ and/or PR+ and HER2-)

BREAST CANCER STAGING

DCIS (Stage 0)

- Accounts for 1 in 6 newly diagnosed breast cancers
- Associated with increased risk of invasive breast cancer later

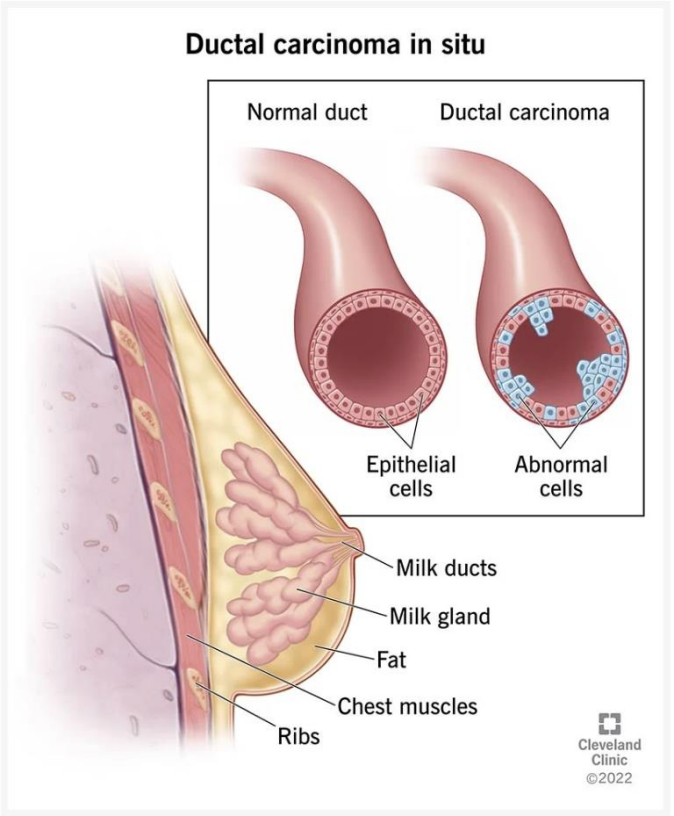


https://www.bci.org.au/breast-cancer-information/fact-sheets/ductal-carcinoma-situ-dcis/

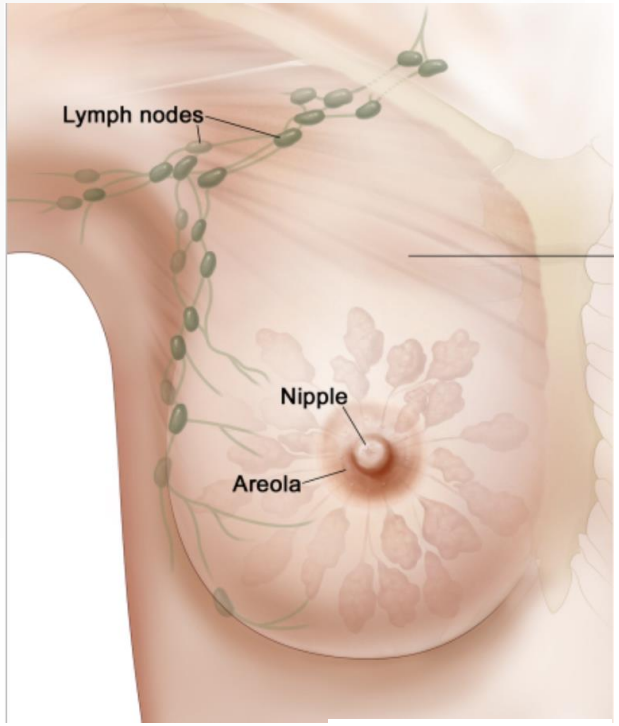
Stage 1
Stage 2
Stage 3
Early stage

Stage 4 (Metastatic)

- 30% survival at 5 years after diagnosis



With ductal carcinoma in situ, precancerous cells haven't spread beyond the milk ducts.



HOW IS BREAST CANCER TREATED?

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TREATING EARLY-STAGE BREAST CANCER

Goal of treatment: CURE

Surgery → remove cancer, determine stage

- Mastectomy
- Breast-conserving surgery (lumpectomy)
- Removal of lymph nodes

Radiation therapy → destroy remaining cancer cells in breast/chest/underarm

- Depends on stage of breast cancer, type of surgery, and age
- Given after surgery

Systemic therapy → travels through bloodstream to destroy cancer cells throughout body

- Can be given before or after surgery
- Treatment depends on subtype and stage
- Chemotherapy
- Endocrine (hormonal) therapy (HR+ breast cancer)
- Targeted therapy (HER2+ breast cancer)
- Immunotherapy (Triple negative breast cancer)

TREATING METASTATIC (STAGE 4) BREAST CANCER

Cannot be cured

Goal of treatment: Palliative (control growth, prolong life, optimize quality of life)

Main treatment is systemic therapy

- Sometimes radiation is used to treat symptoms

We work closely with our palliative and supportive care team

WHAT CAN I DO?

Try to modify the risk factors within your control

- Maintain a healthy weight
- Get regular physical activity
- Minimize alcohol intake

Be proactive about your health

- See a physician annually for preventative care and breast exams
- Breast self-awareness
- Ask about mammography, and enhanced screening/genetic counseling if applicable
- Be aware of your family history (and of changes in your own breasts)

If you are diagnosed with breast cancer

- Find an oncology team that you're comfortable with
- Write down your questions
- Bring a support person to your first visit
- Ask about clinical trials

American Cancer Society Guideline for Breast Cancer Screening, 2015[244]

The following recommendations are for women at average risk of breast cancer (i.e., women without a personal history of breast cancer, a suspected or a confirmed genetic variant known to increase risk of breast cancer [e.g., *BRCA1* or *BRCA2*], a strong family history, or a history of previous radiotherapy to the chest at a young age). All women should become familiar with the benefits, limitations, and potential harms associated with breast cancer screening.

- Women should have the opportunity to begin annual screening between the ages of 40 and 44.
- Women ages 45 to 54 should be screened annually.
- Women ages 55 and older should transition to biennial screening or have the opportunity to continue screening annually.
- Women should continue screening mammography as long as their overall health is good and they have a life expectancy of 10 years or more.

THANK YOU!

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