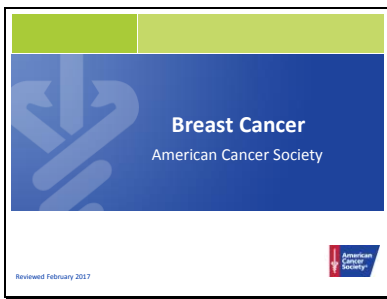


## Slide 1



## Slide 2



This is a summary of what we'll be talking about today.

Breast cancer occurs mainly in women, but men can get it, too. Many people do not realize that men have breast tissue and that they can develop breast cancer. Here we are talking about breast cancer in women.

### If questions come up about breast cancer in men:

- For men, the lifetime risk of getting breast cancer is about 1/10th of 1% (1 in 1,000).
- The American Cancer Society estimates that just over 2,000 new cases of invasive breast cancer are diagnosed among men in the United States each year.
- The number of breast cancer cases in men relative to the population has been fairly stable over the last 30 years.
- Over 400 men die from breast cancer in the United States each year.

More information is available on breast cancer in men at [cancer.org](http://cancer.org)

Slide 3

**Breast cancer: How common is it?**

- The most common cancer in women in the U.S.
- 2nd leading cause of cancer-related death in women in the U.S.
- Death rates have been steadily going down since 1989.

These are some facts about breast cancer.

**Bullet #1:** Other than skin cancer

**Bullet #2:** Lung cancer is the #1 cause of cancer-related death in US women. (The #1 cause of death overall in women is cardiovascular disease.)

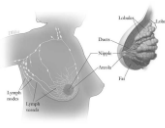
**Bullet #3:** This is thought to mainly be due to earlier detection and improved treatments (decreased incidence may also be a factor).

Slide 4

**What is breast cancer?**

The female breast is made up mainly of:

- **Lobules** – the milk-producing glands
- **Ducts** – tiny tubes that carry the milk from the lobules to the nipple
- **Stroma** – fatty tissue and connective tissue surrounding the ducts and lobules, blood vessels, and lymphatic vessels



Most breast cancers start in the cells that line the ducts (**ductal cancers**). Some start in the cells that line the lobules (**lobular cancers**), while a small number start in other tissues.

Slide 5

**What is breast cancer?**

- Cancer is the growth of abnormal cells.
- The cells can invade and damage normal tissue.
- Breast cancer can start in any part of the breast.
  - Invasive (or infiltrating) ductal carcinoma or IDC
  - Invasive (or infiltrating) lobular carcinoma or ILC

There are several types of breast cancer, although some of them are quite rare.

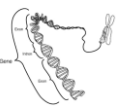
In some cases a single breast tumor can have a combination of these types.

**Bullet #3:** Ductal starts in the ducts, lobular starts in the lobules

Invasive or infiltrating means that the cancer cells have grown out of the ducts or lobules and into the nearby breast tissue. Invasive cancers have the potential to spread out of the breast to lymph nodes and other organs. IDC and ILC are the most common types of breast cancer.

**Causes of breast cancer**

- We do not know the cause of most breast cancers.
- Most likely cause is related to changes in the genetic material (DNA) in our cells.
- DNA changes are often related to our lifestyle, but some can be due to age and other factors.



Some cancer-related DNA mutations can be inherited, which means that the person is born with the mutated DNA in all their body's cells. But most mutations happen after the person is born, and are called acquired mutations.

- Inherited gene mutations are in every cell of the body and can be passed on to children. These mutations can increase the risk for developing cancer and are responsible for the cancers that run in some families. For example, the BRCA genes (BRCA1 and BRCA2) are tumor suppressor genes. Mutations in these genes can be inherited from parents. When they are mutated, they no longer suppress abnormal growth, and cancer is more likely to develop.
- Acquired gene mutations are changes that take place during a person's life. These changes only affect the cells that grow from the one cell where the changes began (but this can mount up to a large tumor over the course of years); most cases of breast cancer are caused by these types of changes

**Breast cancer risk factors**

Risk factors are anything that can increase or decrease a person's chance of getting a disease, such as cancer.

There are many known risk factors for breast cancer. Some of these cannot be changed, but some can...


Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer; smoking is a risk factor for lung, bladder, and many other kinds of cancer.

But risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not mean that you will get the disease. And some people who get the disease may not have any known risk factors. Even if a person with breast cancer has a risk factor, it's often very hard to know how much that risk factor may have contributed to the cancer.

Still, researchers have found several risk factors that may increase a woman's chance of developing breast cancer.

**Breast cancer risk factors**

- Gender
  - Being a woman is the main risk factor for developing breast cancer
- Aging
  - Breast cancer risk increases as a woman gets older



**Gender:** Men can develop breast cancer, but it is about 100 times more common in women.

**Aging:** 1 out of 8 women will be diagnosed with breast cancer in their lifetime.

**Breast cancer risk factors**

- Genetic risk factors
  - About 5% to 10% of breast cancer cases are thought to be hereditary, caused by gene changes (mutations) inherited from a parent.
    - Inherited mutations in BRCA1 or BRCA2 are the most common cause of hereditary breast cancer.
      - Women with BRCA mutations have a high risk of developing breast cancer during their lifetime. When they do develop it, they are often younger than other women with breast cancer who are not born with one of these gene mutations.
    - Mutations in other genes are less common causes of inherited breast cancer.

**BRCA1 or BRCA2:**

- Women with inherited BRCA1 or BRCA2 mutations also have an increased risk for developing ovarian cancer as well as some other cancers.
- Although in the US, BRCA mutations are found most often in Jewish women of Ashkenazi (Eastern Europe) origin, they are also seen in African-American women and Hispanic women and can occur in any racial or ethnic group.

Some of the other genes in which mutations can lead to inherited breast cancer, include PTEN, CHEK2, TP53, ATM, CDH1, PALB2, and STK11, but these are all much rarer than BRCA mutations.

**Breast cancer risk factors**

- Family history of breast cancer
  - Women who have a close blood relative with this disease have a higher risk for breast cancer.
- Personal history of breast cancer
  - A woman with cancer in one breast has an increased risk of developing a new cancer in the other breast or in another part of the same breast.


**Bullet #1:** Having one first-degree relative (mother, sister, or daughter) with breast cancer doubles a woman's risk. Having 2 first-degree relatives with breast cancer increases her risk about 3-fold.

- Although the exact risk is not known, women with a family history of breast cancer in a father or brother also have an increased risk of breast cancer.
- Altogether, less than 15% of women with breast cancer have a family member with this disease. (As a result, it's important to note this means that over 85% of women who get breast cancer do not have a family history of this disease.)

**Bullet #2:** This means a new breast cancer can develop. This is different from a recurrence (return) of the first cancer.

**Breast cancer risk factors**

- Certain non-cancer breast problems
- Previous chest radiation
  - Women who had radiation to the chest for another cancer as a child or young adult are at a much higher risk than those who did not.



**Bullet #1:** Women diagnosed with certain benign (non-cancerous) breast conditions may have an increased risk of breast cancer.


- Non-cancerous breast conditions that cause cell growth in the breast are more closely linked to breast cancer risk than others.
- Women with non-cancerous breast conditions should talk to their doctors to find out if they are at a higher risk for breast cancer.

**Bullet #2:** Women who, as children or young adults, had radiation therapy to the chest area as treatment for another cancer (such as Hodgkin disease or non-Hodgkin lymphoma) are at much higher risk for breast cancer.

- This varies with the patient's age when they had radiation.
- The risk of developing breast cancer appears to be highest if the radiation was given during adolescence, when the breasts were still developing.

**Breast cancer risk factors**

- Post-menopausal hormone therapy (PHT)
  - Increased risk in women who use or recently used combined PHT for many years
- DES exposure
  - Slightly increases risk
- Recent use of hormonal contraceptives
  - Slightly higher risk than in women who never used them, but this goes down after use stops



**Bullet #1:** PHT is used to help relieve symptoms of menopause and to help prevent osteoporosis (thinning of the bones).

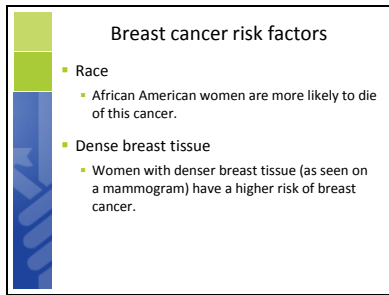
There are 2 main types of PHT: estrogen and progesterone (known as combined PHT) and estrogen alone (known as estrogen therapy (ET)).

- Use of combined PHT increases the risk of breast cancer. The increased risk is seen after as little as 2 years of use.
- The increased risk from combined PHT appears to apply only to current and recent users. A woman's breast cancer risk seems to return to that of the general population within 5 years of stopping combined PHT.
- The use of estrogen alone does not appear to increase the risk of developing breast cancer.

**Bullet #2:** From the 1940s through the 1960s some pregnant women were given the drug diethylstilbestrol (DES) because it was thought to lower their chances of losing the baby (miscarriage). These women have a slightly increased risk of developing breast cancer. Women whose mothers took DES during pregnancy may also have a slightly higher risk of breast cancer.

**Bullet #3:** Using oral contraceptives or the injectable contraceptive DepoProvera increases breast cancer risk. The risk returns to normal within 10 years of stopping the pill and within 5 years of stopping DepoProvera. When thinking about using these drugs, women should discuss all of the risks and benefits as well as their other risk factors for breast cancer with their health care team.

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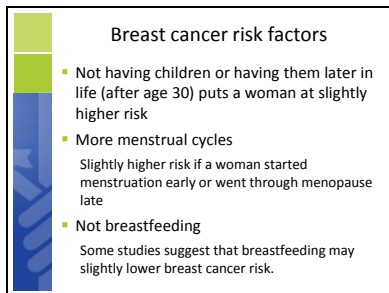
Breast cancer risk factors

- Race
  - African American women are more likely to die of this cancer.
- Dense breast tissue
  - Women with denser breast tissue (as seen on a mammogram) have a higher risk of breast cancer.

**Bullet #1 (part 2):** At least part of this is because invasive breast cancer increased by 0.5% per year in African American women, although why this is the case is not known. Asian, Hispanic, and Native American women have a lower risk of developing and dying from breast cancer.

**Bullet #2:** Women with denser breast tissue (as seen on a mammogram) have more glandular tissue and less fatty tissue, and have a higher risk of breast cancer. Unfortunately, dense breast tissue can also make it harder for doctors to spot problems on mammograms.

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Breast cancer risk factors

- Not having children or having them later in life (after age 30) puts a woman at slightly higher risk
- More menstrual cycles
  - Slightly higher risk if a woman started menstruation early or went through menopause late
- Not breastfeeding
  - Some studies suggest that breastfeeding may slightly lower breast cancer risk.

**Bullet #1:** Having the first full term pregnancy before age 30 and having many term pregnancies reduces breast cancer risk. (A pregnancy that isn't carried to term does not have this protective effect.) Pregnancy reduces a woman's total number of lifetime menstrual cycles, which may be the reason for this effect. Another factor may be the change in breast tissue that occurs in pregnancy to get ready for breastfeeding.

**Bullet #2:** Women who have had more menstrual cycles because they started menstruating at an early age (before age 12) and/or went through menopause at a later age (after age 55) have a slightly higher risk of breast cancer. This may be related to a higher lifetime exposure to the hormones estrogen and progesterone.

**Bullet #3:** Especially if breastfeeding is continued for 1 year or more. One explanation for this possible effect may be that breastfeeding reduces a woman's total number of lifetime menstrual cycles (similar to starting menstrual periods at a later age or going through early menopause).

**Breast cancer risk factors**

- Physical activity
  - More active → lowers risk
- Overweight
  - Obesity → raises risk of having breast cancer, especially for women after menopause
- Alcohol use
  - Clearly linked to increased risk
  - Risk goes up with the amount of alcohol you drink



**Bullet #2:** Before menopause the ovaries produce most estrogen, and fat tissue produces a small amount. After menopause (when the ovaries stop making estrogen), most of a woman's estrogen comes from fat tissue. Having more fat tissue after menopause can increase estrogen levels and increase the likelihood of developing breast cancer. The connection between weight and breast cancer risk is complex. For example, the risk appears to be increased for women who gained weight as an adult but may not be increased among those who have been overweight since childhood.

**Bullet #3:** Compared with non-drinkers, women who consume 1 alcoholic drink a day have a very small increase in risk. Those who have 2 -3 drinks daily have 20% higher risk than women who don't drink alcohol.

**If asked:** In the United States, a standard drink is equal to 13.7 grams (0.6 ounces) of pure alcohol, or

- 12 ounces of beer
- 8 ounces of malt liquor
- 5 ounces of wine
- 1.5 ounces or a "shot" of 80-proof distilled spirits or liquor (such as gin, rum, vodka, or whiskey)

[From the Centers for Disease Control and Prevention, website: [www.cdc.gov/alcohol/faqs.htm#standDrink](http://www.cdc.gov/alcohol/faqs.htm#standDrink)]

**Preventing breast cancer**

- How all women can lower risk:
  - Get to and stay at a healthy weight
  - Be physically active
  - Limit alcohol use
- Some women can also think about things like:
  - Breastfeeding
  - Not using hormone therapy to deal with the symptoms of menopause

All women can lower the risk of breast cancer by changing those risk factors that can be changed.

Preventing breast cancer

- If a woman is known to be at increased risk (due to personal or family history, or known gene mutations) there are some things she can consider to decrease her chances of breast cancer:
  - Chemoprevention—the use of drugs to reduce the risk of breast cancer
  - Preventive surgery for women with very high breast cancer risk

Before deciding which, if any, of these may be right for her, a woman needs to talk with her doctor to understand what her risk is and how much any of these approaches might lower this risk.

### Breast cancer chemoprevention

Several drugs have been studied to lower breast cancer risk.

- **Tamoxifen** is a drug that blocks some of the effects of estrogen on breast tissue. It can lower the risk of getting breast cancer in women who are at increased risk for the disease.
- **Raloxifene** also blocks the effect of estrogen on breast tissue. It's approved to help reduce breast cancer risk in women past menopause who are at high risk for breast cancer.
- Studies are looking at other drugs, too.

### Preventive surgery for women with very high breast cancer risk

For the few women who have a very high risk for breast cancer, prophylactic surgery may be an option.

- **Preventive (prophylactic) bilateral mastectomy:** removing both breasts before cancer is diagnosed.
- **Prophylactic oophorectomy (ovary removal):** Women with a BRCA mutation may reduce their risk of breast cancer by 50% or more by having their ovaries surgically removed. This is because the surgery removes the main sources of estrogen in the body (the ovaries).


Preventing breast cancer

There is no sure way to prevent breast cancer.

But there are things all women can do that might reduce their risk and help increase the odds that if they do get breast cancer, it's found at an early, more treatable stage...



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### Breast cancer screening

- Screening is testing to find cancer, or other diseases, early in people who have no symptoms.
- Screening can help find cancers when they are small and have not spread – when they have a better chance of being cured.
- Breast cancer screening is done with
  - Mammograms
  - In some cases, breast MRI

We'll be talking more about MRI a bit later.

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### Breast cancer screening

- Why screen for breast cancer?
  - Breast cancers found during screening exams are more likely to be small and still confined to the breast.
  - The size of a breast cancer and how far it has spread are important factors in predicting the prognosis (survival outlook).

Most doctors believe that early detection tests for breast cancer save many thousands of lives each year, and that many more lives could be saved if even more women and their health care providers took advantage of these tests.

Following the American Cancer Society's guidelines for the early detection of breast cancer improves the chances that breast cancer can be diagnosed at an early stage and treated successfully.

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### Screening for breast cancer

- ✓ Mammogram

In some cases, Breast MRI (magnetic resonance imaging)


- For women at high risk of breast cancer based on certain factors, both MRI and mammogram exams of the breast are recommended.

**Mammogram**

A mammogram is an x-ray of the breast.

For a mammogram, the breast is pressed between 2 plates to flatten and spread the tissue.

It produces a picture of the breast tissue.




Although this may be uncomfortable for a moment, squeezing is necessary to get a good, "readable" mammogram. The compression only lasts a few seconds.

The entire procedure for a screening mammogram takes about 20 minutes.

This procedure produces a picture of the breast tissue either on a large sheet of film or as a digital computer image that is read, or interpreted, by a radiologist (a doctor trained to interpret images from x-rays, ultrasound, MRI, and related tests).

**Clinical breast exam**



- A clinical breast exam (CBE) is an exam of your breasts by yourself or health care professional
- Research has not shown a clear benefit of physical breast exams done by either a health professional or by yourself for breast cancer screening

**Bullet #1:** Typically occurs during yearly physical with your doctor .

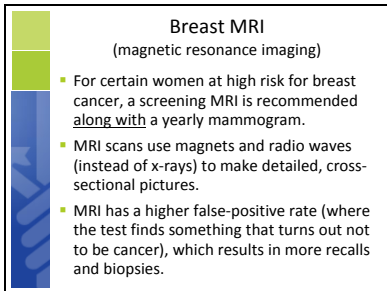
For this exam, the woman undresses from the waist up.

The health care professional will first look at your breasts for changes in size or shape, or changes in the skin of the breasts or nipple. Then, using the pads of the fingers, the examiner will gently feel the breasts and under the arms.

Special attention will be given to the shape and texture of the breasts, location of any lumps, and whether such lumps are attached to the skin or to deeper tissues. The area under both arms will also be examined.

During the CBE is a good time for women who don't know how to examine their breasts to learn the proper technique from their health care professionals. Ask the doctor or nurse to teach you and watch your technique if you are interested in learning how to do it yourself at home.

**Bullet #2:** Regular clinical breast exam and breast self-exam are not recommended in the screening guidelines. Still, all women should be familiar with how their breasts normally look and feel and report any changes to a health care provider right away.

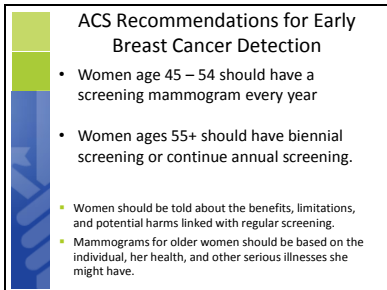


**Breast MRI**  
(magnetic resonance imaging)

- For certain women at high risk for breast cancer, a screening MRI is recommended along with a yearly mammogram.
- MRI scans use magnets and radio waves (instead of x-rays) to make detailed, cross-sectional pictures.
- MRI has a higher false-positive rate (where the test finds something that turns out not to be cancer), which results in more recalls and biopsies.

- MRI is not generally recommended as a screening tool by itself, because although it is a sensitive test, it may still miss some cancers that mammograms would detect.
- MRI is more expensive than mammography. Most major insurance companies will likely pay for these screening tests if a woman can be shown to be at high risk, but it's not yet clear if all companies will do so (often Medicaid does not cover screening MRI).

We will talk in a few minutes about which women are considered at high risk for breast cancer.



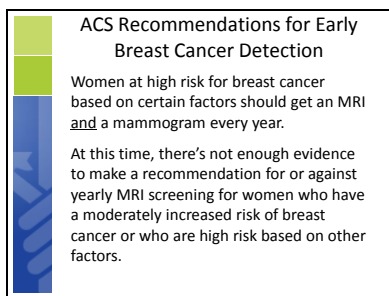
**ACS Recommendations for Early Breast Cancer Detection**

- Women age 45 – 54 should have a screening mammogram every year
- Women ages 55+ should have biennial screening or continue annual screening.
- Women should be told about the benefits, limitations, and potential harms linked with regular screening.
- Mammograms for older women should be based on the individual, her health, and other serious illnesses she might have.

ACS screening guidelines recommend those 40-44 years of age have the option to begin annual mammography

Mammograms can miss some cancers. But despite their limitations, they remain a very effective and valuable tool for decreasing suffering and death from breast cancer.

Other serious illnesses to consider are things like congestive heart failure, end-stage renal disease, chronic obstructive pulmonary disease (COPD), and moderate-to-severe dementia. Age alone should not be the reason to stop having regular mammograms. As long as a woman is in good health and would be a candidate for breast cancer treatment, she should continue to be screened with mammograms.



### **MRI is recommended for women who:**

- Have a known BRCA1 or BRCA2 gene mutation
- Have a first-degree relative (parent, brother, sister, or child) with a BRCA1 or BRCA2 gene mutation, but have not had genetic testing themselves
- Have a lifetime risk of breast cancer of about 20% to 25% or greater, according to risk assessment tools that are based mainly on family history (see below)
- Had radiation therapy to the chest when they were between the ages of 10 and 30 years
- Have Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome, or have first-degree relatives with one of these syndromes

### **ACS doesn't recommend for or against MRI for women who:**

- Have a moderately increased risk of breast cancer (lifetime risk of breast cancer of 15% to 20%) according to risk assessment tools that are based mainly on family history (see below)
- Are at increased risk of breast cancer because they have a personal history of breast cancer, ductal carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS), atypical ductal hyperplasia (ADH), or atypical lobular hyperplasia (ALH)
- Have extremely or "heterogeneously" dense breasts as seen on mammograms

If MRI is used, it should be in addition to, not instead of, a screening mammogram.

For most women at high risk, screening with MRI and mammograms should begin at age 30 years and continue for as long as a woman is in good health.

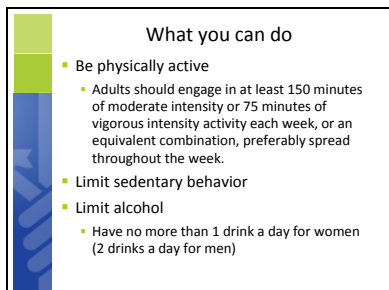
Yearly MRI screening is not recommended for women whose lifetime risk of breast cancer is less than 15%.

### **Risk assessment tools**

Several risk assessment tools, with names such as the Claus model and the Tyrer-Cuzick model, are available to help health professionals estimate a woman's breast cancer risk. These tools give approximate, rather than precise, estimates of breast cancer risk based on different combinations of risk factors and different data sets. (Some of these tools can be found online, if anyone wants to look.) Some risk assessment tools, such as the Gail Model, are not based mainly on family history and so are not appropriate to use to decide on MRI screening using ACS guidelines.



- Be as lean as possible throughout life without being underweight.
- Avoid excess weight gain at all ages. For those who are currently overweight or obese, losing even a small amount of weight has health benefits and is a good place to start.
- Engage in regular physical activity and limit your intake of high-calorie foods and beverages as key strategies for maintaining a healthy weight.



Physically active:

**Moderate intensity activities** are those that require effort equivalent to that of a brisk walk.

**Vigorous intensity activities** generally engage large muscle groups and cause a noticeable increase in heart rate, breathing depth and frequency, and sweating.

Doing some physical activity above usual activities, no matter what one's level of activity, can have many health benefits.

Sedentary behavior = sitting, lying down, watching television or other forms of screen-based entertainment

Alcohol:

The recommended limit is lower for women because of their smaller body size and slower metabolism of alcohol.

These limits refer to daily intake, and do not justify drinking larger amounts on fewer days of the week.

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What you can do

**Get screened.**

- If you are age 45 or older, get your yearly breast cancer screening tests.
- Talk with a doctor about your breast cancer risk.
- Talk with a doctor about your medical history and your family history to find out if you need to start testing earlier or have MRIs done along with your mammograms.

Screening tests offer the best way to find breast cancer early—when it is small and has not spread. Finding cancer early gives you a better chance for successful treatment.

Check with your family members about any breast cancers that they might have had and how old they were when they were diagnosed, so you can tell your doctor.

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More information

You can get more information about breast cancer on our website, [www.cancer.org](http://www.cancer.org), or call 1-800-227-2345 to talk with one of our Cancer Information Specialists.

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Thank you!

