The Technologist's Role in Breast Cancer Risk Assessment

Communicating the benefits of comprehensive risk assessment to patients

Risk based management recommendations

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Risk based management recommendations: Program overview and disclaimer

Overall course description

In this 1-unit module, attendees will review risk-based recommendations based on average and elevated risk categories, including imaging, lifestyle modification, medication, and surgical intervention.

Disclaimer

This information is provided to help answer questions with respect to hereditary cancer risk assessment and hereditary cancer testing. It is general in nature and is not intended to provide a comprehensive, definitive analysis of specific risks. The information provided herein should be taken into consideration with other medical and research information regarding cancer risks, hereditary cancer risks and pre-dispositional cancer testing and risk factors.

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Risk based management recommendations: Learning objectives

01 Review current imaging recommendations for average and high-risk women

02 Explore management options outside of imaging and identify ways in which lifestyle modifications can impact risk

03 Identify resources for patients and providers and consider points to discuss with patients related to breast cancer risk management

04 Learn how to appropriately discuss risk-based management recommendations in collaboration with your facility and leadership team(s)

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Breast imaging recommendations

American Cancer Society – average risk

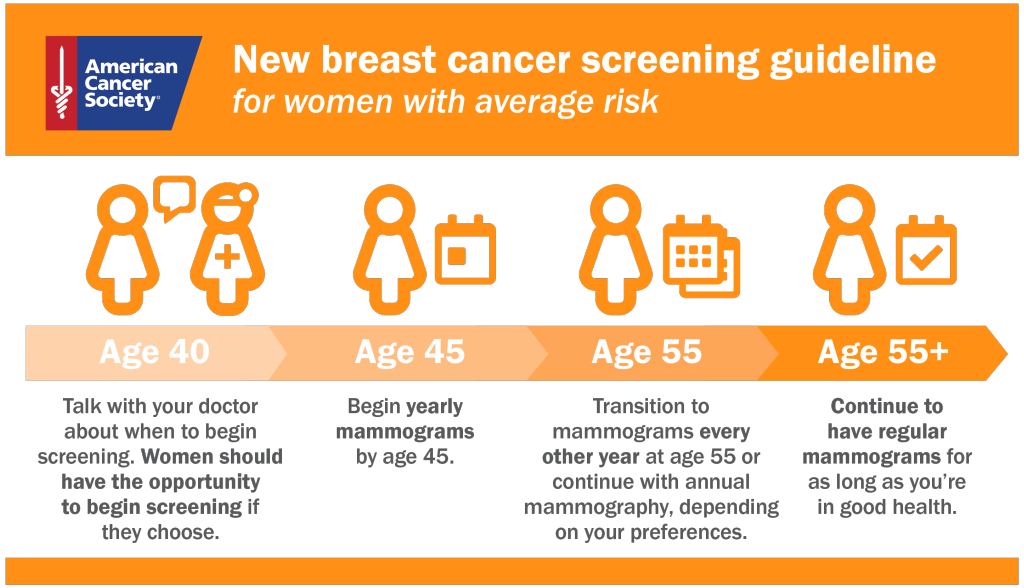
- Women ages 40 to 44 Should have the CHOICE to start annual breast cancer screening with mammograms if they wish to do so.
- Women ages 45-54 should get mammograms every year
- Women 55 and older should switch to mammograms every 2 years or can continue yearly mammograms
- This screening should continue as long as a woman is in good health and is expected to live 10 more years or longer

American College of Radiology – average risk

- Women age 40 and older should have an annual screening mammogram
- Breast Cancer Screening in women ages 75 and older has continued benefits in terms of deaths averted and life-years gained.

NCCN – average risk

- Women ages 25-39 should have a clinical encounter every 1-3 years and practice breast awareness
- Women age 40 and older should have an annual clinical encounter, screening mammogram, with tomosynthesis if available, and practice breast awareness.



Breast imaging recommendations

Defining high risk

- What makes someone elevated/high risk?
- Remaining lifetime risk to develop breast cancer ≥20%
  - This is calculated using risk models that incorporate personal risk factors and/or family history of cancer.
  - Personal risk factors include hormonal history:
    - Age at first period
    - Age at first live birth (or whether the patient has had a live birth)
    - Age that menopause began
    - Systemic hormone replacement therapy use and type (this does not include birth control)
  - Breast biopsy history:
    - *Being diagnosed with ADH, ALH, or LCIS*
- Family history risk factors
  - Close relative diagnosed with breast cancer
  - Multiple relatives on the same side of the family with breast cancer
  - Relatives with early onset breast cancer (<50 years old at time of diagnosis)
  - Ashkenazi Jewish ancestry
  - Family history of gene mutation that causes elevated risk
- Another cause of elevated breast cancer risk include thoracic radiation therapy between ages 10 and 30.
  - This is typically done for treatment of Hodgkin's lymphoma

Key definitions: ALH, ADH, LCIS - Examples of breast biopsy findings that place a patient at a significantly increased risk of developing breast cancer (ACS)

High risk breast imaging recommendations

NCCN – elevated Risk

Remaining lifetime risk ≥20% based on models largely dependent on family history:

- Annual Screening mammogram with tomosynthesis if available
  - Starting at the age 10 years prior to the youngest family member diagnosed with breast cancer, but not prior to age 30. Or begin at age 40 if this comes first.
- Annual breast MRI
  - Starting at the age 10 years prior to when the youngest family member diagnosed with breast cancer, not prior to age 25. Or begin at age 40 if this comes first.
  - For women who qualify but cannot have MRI, consider contrast-enhanced mammography or whole breast ultrasound

Thoracic radiation therapy between ages 10-30 years of age:

- Annual Screening mammogram with tomosynthesis if available
  - Starting 8 years after radiation therapy, but not before age 30
- Annual breast MRI
  - Starting 8 years after radiation therapy, but not before age 25
  - For women who qualify but cannot have MRI, consider contrast-enhanced mammography or whole breast ultrasound

High risk breast imaging recommendations

ACR– elevated risk

Remaining lifetime risk ≥20% or Genetics* based risk:

- Annual Screening mammogram with or without tomosynthesis.
  - Initiate at age 30
  - Women diagnosed with breast cancer, ADH, or lobular neoplasia before age 40 should also initiate mammography screening annually at the time of diagnosis.
- Annual breast MRI
  - Performed annually beginning at age 25 to 30.
  - Women with personal histories of breast cancer and dense breast tissue, or those diagnosed before age 50, annual breast MRI is also recommended.

Thoracic radiation therapy before 30 years of age:

- Annual Screening mammogram with or without tomosynthesis
  - Beginning at age 25 or 8 years after radiation therapy, whichever is later
- Annual breast MRI
  - Starting 8 years after radiation therapy, but not before age 25

Practice: Patient examples

Patient 1

Remaining lifetime risk of breast cancer ≥20% based on family history model.

- Current age 32
- Has a grandmother who was diagnosed with breast cancer at age 45, and an aunt who was diagnosed at age 55.
- When should she start screening and what imaging is recommended for her?

Patient 2

Remaining lifetime risk of breast cancer ≥20% based on family history model.

- Current age 26
- Has a sister who had breast cancer diagnosed at 38, and two aunts who were diagnosed after age 65.
- When should she start screening and what imaging is recommended for her?

Practice: Patient examples

Patient 3

Remaining lifetime risk 12% based on family history models:

- Currently age 45
- No family history of cancer
- When should she start screening and what imaging is recommended for her?

Patient 4

Elevated Risk due to Hodgkin's lymphoma treatment at age 18 with thoracic radiation therapy.

- Current age 24
- Family history of breast cancer in great grandmother at age 89.
- When should she start screening and what imaging is recommended for her?

Screening vs. diagnostic imaging

Screening

- Screening tests and exams are used to find a disease in people who do not have any symptoms.
- Annual mammography for women at average risk are screening mammograms. If abnormal, they will undergo diagnostic imaging because now they have a "sign or symptom" of potential disease.

Diagnostic

- Diagnostic tests are used to diagnose a disease in an individual with signs or symptoms of the disease.
  - Example: Patient has a lump in their breast and will undergo diagnostic mammogram to assist with potential diagnosis of breast cancer. They may also have other diagnostic tests such as a breast biopsy.

Other management options/considerations

What else can be done to reduce risk?

- Lifestyle Modifications – for average and high-risk individuals
- Risk reducing medications – for high-risk individuals
- Surgery – for high-risk individuals

Lifestyle modifications

Modifiable risk factors

1. **Alcohol Consumption** – Relative risk for women consuming approximately four alcoholic drinks per day compared to non-drinkers is 1.32.
   - The relative risk of breast cancer increases by about 7% per each drink of alcohol consumed per day.
   - Women who have one alcoholic drink a day have a smaller (about 7% to 10%) increase in risk compared with those who don't drink, while women who have 2 to 3 drinks a day have about a 20% higher risk.
   - Definition of a serving of alcohol per the American Cancer Society is 12 oz of beer, 5 oz of wine, or 1.5 oz of 80-proof liquor

2. **Maintaining healthy weight** – Obesity (>30 BMI) is associated with an increased breast cancer risk in many large studies. Particularly in women who are post-menopausal.
   - An observational study of 85,917 women found body weight to be associated with breast cancer. When comparing women weighing more than 180lbs with those weighing less than 130lbs, the relative risk was 2.85.

www.cancer.gov, www.cancer.org

Lifestyle modifications

Modifiable risk factors

3. Exercise/activity level – Relative exercise can decrease breast cancer risk
   - The American Cancer Society recommends all adults engage in at least 150 minutes of moderate intensity or 75 minutes of vigorous intensity activity each week, preferably spread throughout the week.
   - The average relative risk reduction association is 20% for both pre- and post menopausal women, and affects the risk of both hormone-sensitive and hormone-resistant cancers.
     - ***A large meta-analysis included 236,955 women showed that women who exercised have a significant decrease in breast cancer risk (odds ratio of 0.78), with similar effect size for pre- and post-menopausal women.***

www.cancer.gov, www.cancer.org

Lifestyle modifications

Possibly modifiable risk factors

- **Age at first live birth:**
  - Women who have a full-term pregnancy prior to age 20 have a 50% decreased breast cancer risk compared with women who do not give birth or who give birth the first time after age 35.
- **Breastfeeding:**
  - In a large study, women who breastfed were less likely to develop breast cancer than those who did breastfeed
  - Length of breast feeding: relative risk of breast cancer decreased by 4.3% for every 12 months of breast-feeding in addition to a decrease of 7.0% for each birth.
- **Hormone replacement therapy:** Several large studies have looked at the impact of post-menopausal hormone replacement therapy and breast cancer risk.
  - Combined estrogen-progestin use is associated with approximately a 26% increase in breast cancer incidence.
  - Estrogen only therapy that began at the time of menopause is associated with an increase of 17-33% depending on duration of use.

Collaborative Group on Hormonal Factors in Breast Cancer (2002). Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50302 women with breast cancer and 96973 women without the disease. *Lancet (London, England)*, *360*(9328), 187–195. https://doi.org/10.1016/S0140-6736(02)09454-0

Other management considerations

Risk-reducing medications

- Risk-Reducing Medications (chemoprevention) refer to taking medications that can help lower the risk of developing a disease.
- Common medications used to reduce breast cancer risk include tamoxifen (for pre-menopausal women) and raloxifene.
  - These medications are usually taken for at least 5 years to lower the risk of breast cancer by up to 40%
  - Risk-reducing medications can be considered for women whose 5-year risk to develop breast cancer is at least 1.7% using the Gail model or 10 year risk of 5% by Tyrer Cuzick model.
  - These medications are SERMs (selective estrogen receptor modulators). Estrogen can drive the growth of breast cancer cells. SERMS block estrogen in the breast cells.
  - Raloxifene is also used for women who have already gone through menopause to prevent and treat osteoporosis.
- Other Medications, called aromatase inhibitors, are sometimes used as chemoprevention as well, though they are typically used as adjuvant therapy (after curative surgery) to reduce the risk of new primary breast cancers for women with a previous breast cancer diagnosis.
- All medications have the potential for side effects, and there are some contraindications for risk-reducing medications, such as previous history of a stroke or blood clots.

Key definitions: **Selective Estrogen Receptor Modulators (SERMS)** - A drug that acts like estrogen on some tissues but blocks the effect of estrogen on other tissues (NCI)

Other management considerations

Surgery

- Surgical interventions that reduce breast cancer risk:
  - **Risk reducing bilateral salpingo-ophorectomy (BSO) in pre-menopausal women reduces breast cancer risk significantly**
- **For women with BRCA1/2 mutations as well as women with increased breast cancer risk resulting from thoracic radiation the breast cancer incidence may be decreased by up to 50%.**
  - This is because it initiates early menopause, reducing the overall time that the ovaries are generating certain hormones such as estrogen and progesterone.
  - These surgeries are recommended for women with certain genetic related risks (such as having a mutation in BRCA1 or BRCA2) for both breast and ovarian cancers.
  - Risk reducing prophylactic mastectomy (removal of the breast tissue with the purpose of preventing breast cancer) is also something that can be considered for individuals with specific genetic related risks.

Key definitions: BSO - Bilateral salpingo-oophorectomy - Surgical removal of both fallopian tubes and both ovaries (NCI)

Key take-away points

Key take-away points

Key points

- Breast cancer screening is an important tool for both average and high-risk individuals.
- High-risk individuals may benefit from increased screenings and/or early initiation of screenings compared to average risk individuals
- Risk can be influenced by both personal and family history risk factors
- Lifestyle modifications can be used by average and high-risk individuals to reduce breast cancer risk
- High risk individuals have additional options to assist with risk reduction
- Risk assessment is important to determine the best/most appropriate screening and risk reduction options for individual patients
- Asking the right questions can help with risk assessment in an imaging center setting
- Resources are available for patients and providers who want additional information about breast cancer screening and risk reduction

Apply what you've learned, put into practice, and tips for implementation

Within the guidelines of your clinical practice in collaboration with your multi-disciplinary team

Talk to your leadership team or Lead Interpreting Physician (LIP) about some of the questions you get from patients regarding how risk assessment and genetic testing change their care plan. Ask for their recommendation on how to appropriately answer their questions.

Example question/verbiage:

How does testing change my care?

Knowing your risk help you and doctors to make the best decisions about managing your risk, keeping you in control of your health and helping you live your best life. Care recommendations often involve

- Different types of imaging or more frequent screening based on your personal risk
- Lifestyle modifications

There may be other recommendations, but fortunately, each test comes with an individualized cancer prevention care plan for you and your doctor to review and create a plan that is right for you.

Resources

Patient resources

- American Cancer Society website: https://www.cancer.org/
- National Breast Cancer Foundations website: https://www.nationalbreastcancer.org/
- For high-risk individuals – FORCE (facing our risk of cancer empowered): facingourrisk.org
- Susan G. Komen foundation: https://www.komen.org/

Resources

Resources for healthcare professionals

- NCCN guidelines: https://www.nccn.org/home
- USPSTF guidelines: https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening
- ASBS guidelines: https://www.breastsurgeons.org/
- ACR: https://www.acr.org/
- SBI: https://www.sbi-online.org/
- NCBC: https://www.breastcare.org/
- ACS: https://www.cancer.org/
- Mammography Educators: https://mammographyeducation.com/
- NCI (PDQ): https://www.cancer.gov/publications/pdq

Thank you for joining!

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Program 4: Risk based management recommendations

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