# The Presentation of Triple Negative Breast Cancer in Mammography

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## Introduction

More than 40,000 women die from breast cancer in the United States annually. Screening mammography provides the largest-magnitude reduction in breast cancer; improving breast cancer survival through early detection. Annual screening for women begins at age 40. Triple negative breast cancer (TNBC) is an inherently-aggressive phenotype that is more difficult to detect on mammography and has lower survival compared to non-TNBC, even when detected early. TNBC is also twice as common among African American (AA) women compared to White American (WA) women, thereby contributing to the higher breast cancer mortality rates observed in AA women. The role of screening mammography in addressing breast cancer disparities is therefore worthy of study.

(Bayard, et al., 2021)

**Purpose of Mammography**

- Early detection of breast abnormalities and cancer which aids in early intervention procedures.
- Breast cancer patient survival rate has improved from 75% to 90% with the help of early detection

(Long, 2018)

## Mammography Procedure

•Specialized Imaging modality
•Uses digital breast tomosynthesis (DBT) to obtain 3D images of the breasts
•Breast is compressed by compression paddle to immobilize patient and to allow for even distribution of breast tissue
•During the short scan, the x-ray tube arches over the compressed breast and obtains multiple low-dose images
•Result: multiple slices of breast tissue
(Long, 2018)

(The Wave, 2021)

## Types of Mammograms

**Screening Mammogram Indications**

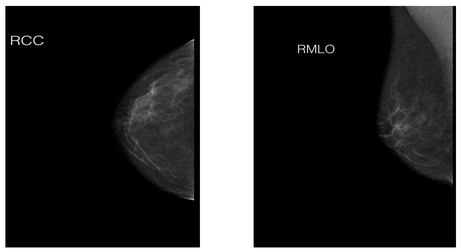
- Women should begin getting screening mammograms starting at age 40
- Patient is asymptomatic
- Contains CC (superior to inferior or craniocaudal) and MLO (mediolateral oblique) views on both breasts

**Diagnostic Mammogram Indications**

- Patient presents an issue such as:
  - Pain
  - Palpable lump
  - Calcifications
- Special images required depending on the issue presented
  - Magnification views: magnifies area of interest
  - Tangential views: area of interest in profile
  - Spot views: uses smaller compression paddle for increased pressure on area of interest
  - ML: medial to lateral side of breast or LM: lateral to medial side of breast

(Long, 2018)

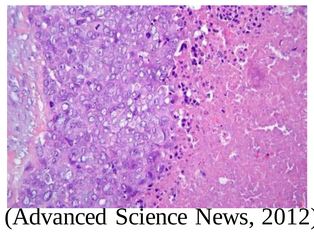
## Image of Normal Mammogram




(Radiopaedia, 2021)

## Triple-Negative Breast Cancer (TNBC)

•Triple-Negative Breast Cancer (TNBC) is an invasive breast cancer absent of estrogen receptor, progesterone receptor, and HER2 protein
•TNBC is more aggressive than other types of breast cancer, difficult to treat, and patients are more likely to have a recurrence
•Mostly basal cell-like in appearance
(Sheng, 2022)



(Advanced Science News, 2012)

## Statistics

•TNBC accounts for 10% of all breast cancers
•TNBC is most common in women who are
-Younger than 40 years of age
-African American (20% who have breast cancer have TNBC)
•Women who contain the BRCA1 mutation are also most likely to develop TNBC
-BRCA is important for defense against cancer
-If a mutation is present, the patient is more susceptible to TNBC
(Triple Negative Breast Cancer, 2022)

## Stages of Breast Cancer & Survival Rates

•Localized
-No sign cancer has spread outside of breast
•Regional
-Cancer has spread to nearby structures and/or lymph nodes
•Distant
-Cancer has spread to distant parts of body

**Survival Rate over 5 years**

•Localized: 91%
•Regional: 65%
•Distant: 12%
(Triple Negative Breast Cancer, 2022)

## Image of TNBC

This image presents a 50-year old woman that complained of a palpable mass in left breast

(Radiopaedia, 2021)

## Symptoms

TNBC presents the same symptoms as most invasive breast cancers:
•Swelling of breast
•Skin dimpling
•Pain within the breast or nipple
•Breast skin that is red or flaking
•Discharge from nipples
•Swollen axillary lymph nodes
(Triple Negative Breast Cancer, 2022)

## Methods for Diagnosis

**Diagnostic mammogram**

•Searching for calcifications and/or masses

**Ultrasound**

•Performed if there is a palpable mass that is not present on the diagnostic mammogram

**Breast MRI**

•Highly efficient for detection of breast cancer
•Preferred for diagnosis if the patient has a large family history of breast cancer
•Determines severity of carcinoma

**Biopsy**

(Dass, et al., 2021)

## Treatment

•TNBC has few treatment options
•Immunotherapy
-Promising treatment
-Consists of immune checkpoint inhibitors
-Sometimes combined with chemotherapy (depending on severity)
•Chemotherapy in combination with surgery
-Surgery includes a lumpectomy or mastectomy
-Chemo will reduce tumor size and surgery will remove tumor from breast
-Chemo may be administered after to reduce a recurrence of TNBC
(Keenan & Tolaney, 2020)

## Prognosis

•TNBC typically has a poor prognosis when compared to other types of breast cancer
•Even with early detection, TNBC proliferates rapidly and does not respond to normal treatments
•TNBC also has a greater chance of recurrence
(Sheng, 2022)

## Conclusion

Mammography is a specialized imaging modality that allows for early detection of breast cancer. The mammographic x-ray tube takes multiple images of each breast which results in a greater volume of breast tissue to be viewed. Unfortunately, even though mammography gives those with breast cancer positive outcomes, the same cannot be said for those with invasive breast cancers like TNBC. TNBC's growth is rapid due to its lack of estrogen receptors, progesterone receptors, and the HER2 protein. Treatment includes different therapies and surgery; however, the prognosis is poor. Research is still being performed to help those with TNBC have a positive outcome. Women 40 years of age and older should continue to get yearly mammograms to help reduce their chances of breast cancer.