BC CANCER BREAST SCREENING
Provincial Health Services Authority

Discussion Guide: Breast Density

Helping Patients Understand Breast Density and Their BI-RADS Assessment

The BC Cancer Breast Screening Program includes a breast density assessment with screening mammography results. This is sent to both providers and screening program participants. This guide has been developed to support your conversation with patients about breast density.

1 Breast Density

Review the patient's BI-RADS assessment with them. Explain that:

- Breasts are composed of two main types of tissue - fibroglandular tissue and fatty tissue. Normal fibroglandular tissue appears dense on a mammogram, while fatty tissue appears non-dense.
- Breast composition (the amount of fibroglandular tissue and fatty tissue) varies from person to person and can change over time and from one mammogram to the next.
- Most women's breasts become less dense as they get older.
- Radiologists categorize breast composition using the Breast Imaging Reporting and Data System (BI-RADS) to assess the volume of normal dense breast tissue that is visible on mammography[1]. The density of breast tissue can only be seen on a mammogram and its categorization is commonly referred to as ***breast density.***
- There are four BI-RADS categories (Figure 1) in the breast composition assessment scale, with BI-RADS A having the least amount of dense tissue and BI-RADS D having the most amount of dense tissue.
- A BI-RADS assessment can help indicate the relative possibility that a cancer could be obscured by the tissue, decreasing the sensitivity of a mammogram[1]. This increases the potential for a cancer to present clinically before the next mammogram is due (also known as an interval cancer). Increased dense tissue has also been identified as a risk factor for breast cancer.
- The C and D categories are commonly referred to as ***dense breasts.*** However, it is important to understand that breast density is a spectrum from A through D. This means, for example, that an individual with a B category will have some density, and that the risk magnitude varies between the C and D categories.

FIGURE 1: DESCRIPTION OF BREAST DENSITY CATEGORIES

BI-RADS A	BI-RADS B	BI-RADS C	BI-RADS D
Almost entirely fatty 15% of BC population 95.1% mammographic sensitivity	Scattered areas of fibroglandular density 44% of BC population 92.5% mammographic sensitivity	Heterogeneously dense, which may obscure small masses 34% of BC population 85.3% mammographic sensitivity	Extremely dense, which lowers the sensitivity of mammography 7% of BC population 72.5% mammographic sensitivity

Role of Mammography

- Women should continue to get regular screening mammograms regardless of their breast density.
- Mammograms are the only screening modality proven to be effective in decreasing a woman's risk of dying from breast cancer. The ability of mammography to detect cancer remains high for all breast density categories.
- It is important to remind your patients that no screening test is perfect and dense breast tissue can make it harder to find cancer on a mammogram.
- It is important to investigate all breast changes, even if a recent mammogram was normal.

2 Risk of Breast Cancer Related to Breast Density and Other Risk Factors

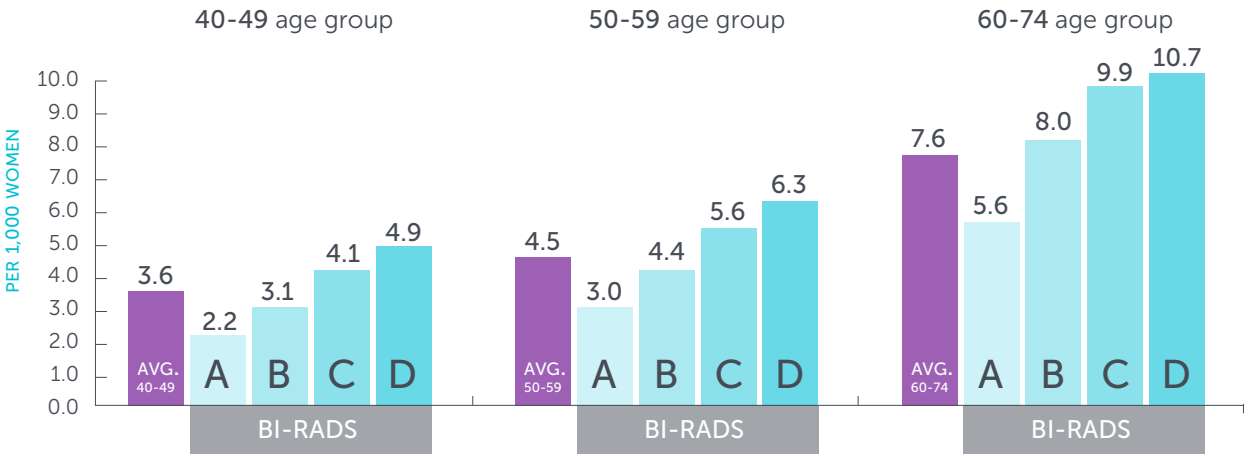
Understanding Breast Density as a Risk Factor

Individuals with dense breast tissue are at increased risk for breast cancer and have a higher probability of an invasive breast cancer diagnosis in the two years following a screening mammogram. This risk increases with age.

If your patient is anxious about their BI-RADS category, reassure them that although dense breast tissue is a risk factor, having extremely dense breast tissue (BI-RADS D) does not necessarily mean that they are at "high" risk for developing the disease.

- A woman age 40-49 with extremely dense breasts (BI-RADS D) has a smaller risk of developing breast cancer than an average risk 60-69 year old woman (Table 1).
- Among 1,000 BC women age 60-74 in the BI-RADS D category, the estimated number of new breast cancer diagnoses over the next two years is 10.7, meaning that 989 women will not be diagnosed with breast cancer.

TABLE 1: PROBABILITY OF BEING DIAGNOSED WITH INVASIVE BREAST CANCER IN NEXT TWO YEARS FOR BREAST SCREENING PARTICIPANTS



Additional Breast Cancer Risk Factors

Speak with your patient to see if there are any additional breast cancer risk factors (Table 3). The overall risk for breast cancer is influenced by a complex combination of many different factors, including:

- Increasing age – which is the greatest risk factor after being female.
- Certain inherited gene mutations, including BRCA1 and BRCA2.
- Personal history of breast cancer.
- Prior breast biopsy showing certain non-cancerous pathologies, such as Atypical Ductal Hyperplasia, Atypical Lobular Hyperplasia, and classical Lobular Carcinoma In Situ.
- History of breast cancer in a first-degree family member, such as mother, daughter, or sister.

Healthy lifestyle choices may help lower breast cancer risk. It is important to maintain a healthy body weight and an active lifestyle, limit alcohol, breastfeed if possible and weigh the risks and benefits of hormone therapy for menopause symptoms. More information on modifiable risk factors can be found at www.fiveplus.ca. There are a number of online tools available to calculate risk for breast cancer based on different combinations of these factors. Two risk calculators that you may find helpful are:

The Breast Cancer Risk Assessment Tool
www.cancer.gov/bcrisktool
This tool does not include breast density information.

Breast Cancer Surveillance Consortium Risk Calculator
https://tools.bcsc-scc.org/bc5yearrisk
This tool includes information on breast density.

Relative Risk

Another way to describe the risk of breast cancer is by explaining "relative risk". A relative risk of greater than 1 indicates a higher risk of being diagnosed with breast cancer compared to an average woman in that age group.

In Table 2 we compare the risk of breast cancer in women in each BI-RADS category to the risk of breast cancer in average BC women in the same age group (across all BI-RADS categories). For example, for BC women age 60-74, a relative risk of 1.42 in the BI-RADS D category means that the risk of breast cancer is 42% higher than the average for that age group. Women with the least dense tissue (BI-RADS A) are at the lowest breast cancer risk, regardless of age.

Based on current evidence there is no relative risk threshold where additional supplemental testing is proven to be beneficial.

TABLE 2: ESTIMATED RELATIVE RISK* OF AN INVASIVE BREAST CANCER DIAGNOSIS WITHIN TWO YEARS FOR BC WOMEN AGES 40-74 BY AGE GROUP AND BREAST DENSITY

Breast Density	Ages 40-49	Ages 50-59	Ages 60-74
A	0.60	0.68	0.74
B	0.87	0.97	1.05
C	1.15	1.24	1.31
D	1.36	1.40	1.42

* Relative risk compared to the average rate across all density groups

TABLE 3: COMPARISON OF BREAST CANCER RISK FACTORS

Risk Factor	Estimated Maximum Relative Risk
BRCA1 or BRCA2[2]	15x*
Personal history of breast cancer[3]	7x to 10x*
Prior breast biopsy showing certain non-cancerous pathologies	
- Atypical Ductal Hyperplasia[3]	5x*
- Atypical Lobular Hyperplasia; classical Lobular Carcinoma In Situ[4]	4x to 10x*
First-degree relative (mother, sister) diagnosed with breast cancer by age 50[3]	2x*
Obesity	1.3x*
Alcohol Use	1.6x*
BI-RADS C (heterogeneously dense)	1.3x†
BI-RADS D (extremely dense)	1.4x†

* Risk compared to the risk in women without that risk factor
† Invasive cancer within two years compared to average density

3 Supplemental Testing

The purpose of breast screening is to identify cancer at a sufficiently early stage so that long term prognosis is improved and the risk of death due to breast cancer is reduced. Breast screening does not reduce an individual's risk of breast cancer.

There is currently insufficient evidence to prove that women with dense breast tissue as a sole risk factor will benefit from supplemental testing with other imaging modalities. Given this lack of evidence, the recent Canadian Task Force on Preventive Health Care guidelines and the U.S. Preventive Services Task Force do not recommend supplemental testing despite the increased risk[5,6].

Available evidence does indicate that such supplemental tests do have the ability to detect additional cancers after a negative mammogram screen. While this may include small and node negative disease, it is unknown what proportion of these cases (i) represent overdiagnosis (cancer that would cause no morbidity during a patient's lifetime), (ii) might have been found at the next screening mammogram, or (iii) represent an opportunity to decrease breast cancer mortality.

A randomized study is underway to look at the value of breast ultrasound as a supplemental test, and may address some of these questions[7]. It is important that health care providers discuss both benefits and limitations of supplemental ultrasound testing with their patients prior to referring them. The latter include aspects similar to mammography such as false positives and limitations in sensitivity. If deemed appropriate, supplemental ultrasound is available to individuals in accordance with applicable BC Medical Services Commission Payment Schedule billing rules for breast ultrasound through diagnostic services.

There is also limited evidence regarding combinations of risk factors, but the coexistence of other risk factors may increase the value of supplemental testing. For example, the balance of benefits and limitations may be more favourable for women with extremely dense breasts and a positive family history.

4 More Information

We recognize that notifying patients of their breast density may lead patients to have questions on what they should do next.

- Everyone who receives a mammogram with the BC Cancer Breast Screening Program will receive additional information on breast density when they receive their mammography result.
- Information about breast density, risk factors for breast cancer and screening mammograms can be found at www.screeningbc.ca/breast.

References

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2. Couch FJ, DeShano ML, Blackwood MA, et al. BRCA1 mutations in women attending clinics that evaluate the risk of breast cancer. N Engl J Med. 1997;336 (20):1409-1415.
3. Singletary SE. Rating the risk factors for breast cancer. Annals of Surgery 237 (2003) 474-482.
4. Wen HY, Brogi E. Lobular Carcinoma In Situ. Surgical Pathology 11 (2018) 123-145. S
5. Supplemental Screening for Breast Cancer in Women With Dense Breasts: A Systematic Review for the U.S. Preventive Services Task Force. Ann Intern Med. 2016;164(4):268. Epub 2016 Jan 12.
6. https://canadiantaskforce.ca/guidelines/published-guidelines/breast-cancer-update/
7. Ohuchi, N. et al. Sensitivity and specificity of mammography and adjunctive ultrasonography to screen for breast cancer in the Japan Strategic Anti-cancer Randomized Trial (J-START): a randomised controlled trial. The Lancet 387 (2016) 341-348.

Data Notes

1. BC Cancer Breast Screening Program data used to calculate discussion guide statistics.
2. Overall Sensitivity calculation includes DCIS and invasive breast cancers detected by digital mammography.
3. Absolute and relative risk calculated:
   a. For all program screens completed 2011-2015, with follow-up to 2016, for women ages 40-74.
   b. Includes digital and analog images.
   c. For invasive cancers only (includes screen detected and interval invasive cancers).
   d. Excludes women whose 1st screen in the study period (at the beginning of each screening round) results in a screen detected cancer (prevalent cancers).
4. BI-RADS percentage of the population estimates provided for 2018.

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