

Provincial Health Services Authority

BC Cancer Breast Screening

Jun 18, 2020

Colin Mar, Medical Director



Provincial Health Services Authority

No disclosures

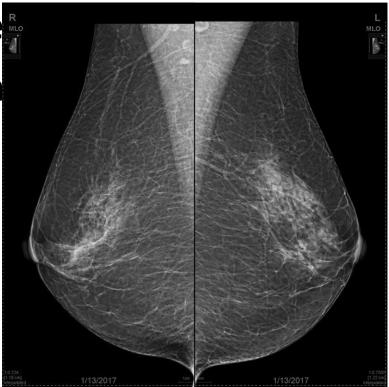
Objectives

 Describe current BC breast screening guidelines;

Summarize risks and investigations of

patients with dense bre

 Identify at risk popula screening uptake



Diagnostic

- Work-up of positive screening mammogram
- Symptomatic
- Breast implants
- Surveillance



Breast Cancer Risk in Canada

- Most common Ca in women at 25.0%
- Lifetime risk:
 - 12.1%; 1 in 8
 - Probability (%) in next 10y, by age group (2010)

30-39	40-49	50-59	60-69	70-79	80-89
0.4	1.4	2.2	3.2	3.3	2.6

 Est 26900 (3500 in BC) new cases in 2019; est incidence of 128.0 per 100000

Breast Cancer Mortality in Canada

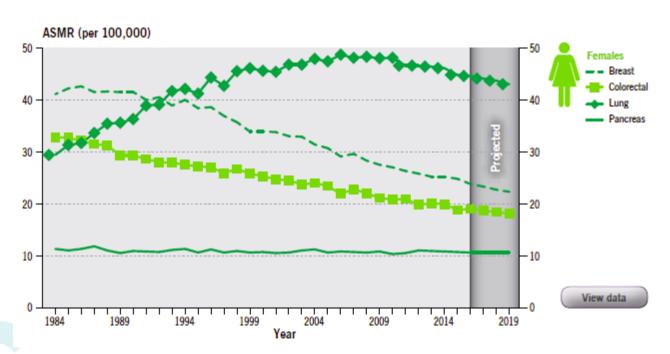
- Second most common cause of Ca death in women at 12.9% (2019)
- Lifetime mortality risk
 - 3%; 1 in 33 (2019)
 - Probability (%) of death in next 10y, by age group (2010)

30-39	40-49	50-59	60-69	70-79	80-89
	0.2	0.4	0.6	0.9	1.3

Breast Cancer Mortality in Canada

But decreasing mortality rate





- Estimated age-standardized mortality rate (per 100000; 2019)
 - 22.4 Canada
 - 21.3 BC

Canadian Cancer Statistics Advisory Committee. *Canadian Cancer Statistics 2019*. Toronto, ON: Canadian Cancer Society; 2019. Available at: cancer.ca/Canadian-Cancer-Statistics-2019-EN (accessed 2019 09 11)

Breast Cancer Survival in Canada

Predicted net survival				
5-y	88			
10-у	82			



Provincial Breast Screening Access

- Funded and coordinated by BC Cancer Breast Screening
- Contracts with the Health Authorities and private Community Imaging Clinics
- Hospital, community and mobile clinics.



Provincial Breast Screening Access

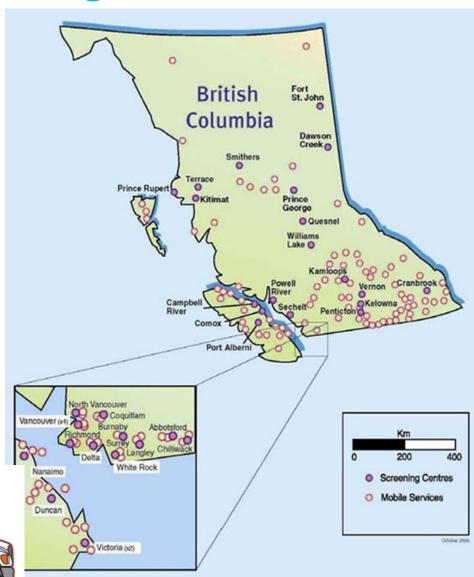
- 36 fixed centres
 - $-8 \times NHA$
 - -6xIHA
 - $-8 \times FHA$
 - 7 x VCH
 - -7xIH



Provincial Breast Screening Access

- Rural, remote and underserviced communities receive mobile van screening
 - Coastal
 - Interior Kootenay
 - Northern/Lower Mainland
- ~8% of program volume





COVID-19: resumption

- June 1
- Triage
 - 1. Postponed screenees
 - i. Initial screens, women ages 50-74 (higher CDR)
 - ii. Remaining women to be triaged as best possible by greatest time since last screen (interval proportion)
 - 2. Postponed reminder notices, to resume after initial bookings are caught up
- Patient and staff safety measures

Evidence for Screening Mammography

Summary of Randomized Controlled Trials of Population-Based Mammography Screening for Breast Cancer Mortality Risk Reduction

Trial	Year	Age	Follow-Up
HIP	1963	40-64	18 years
MMST1	1976	45-69	19.2 years
Two County	1977	40-74	29 years
Edinburgh	1979	45-64	14 years
CNBSS1&2	1980	40-59	25 years
Stockholm	1981	40-64	11 years
Gothenburg	1982	39-59	10 years
UK Trial	1991	40-41	o-10 years



Screening: downsides

- Radiation
- False Positives
 - Anxiety
- Overdiagnosis



Screening: radiation

Exam	Equivalent # of Chest x- ray exams	Equivalent period of Natural Background radiation**	Equivalent # of cigarettes smoked ³
Chest x-ray	1	6 days	12
Chest CT	140	2.5 years	2277
Mammogram	16	3-4 months	29

^{**} Based on a background radiation dose of 3 mSv/year

 IARC 2015: sufficient evidence that BrCa reduction outweighs rad-induced malignancy

Screening: radiation

	_	_	 Lifetime risk of f 	atal #
Exam	of Chest x-	Nat	breast cancer w	ith exp $^{\mathbf{s}}$
	ray exams		at 10	
Chest x-ray	1		at 40yo	
Chest CT	140 ~		• 1.3-1.7/100,0	000
Mammogram	16		3 – 4 months	29

~one return flight to

Toronto

** Based on a background radiation dose of 3 mSv/year

IARC 2015: sufficient evidence that BrCa reduction outweighs rad-induced malignancy

Screening: downsides

- Radiation
- False Positives
 - Anxiety
 - Following result
 - Surrounding biopsy (bx)
 - Risks of bx
 - Awaiting bx result
 - Retention rate effect
- Overdiagnosis



Outcome Indicators: Benefit

Breast Screening Outcome Indicators by 10-Year Age Groups: 2015

Outcome Indicators	Age at Exam					
Outcome marcators	40-49	50-59	60-69	70-74	75+	All
Number of Exams	50,070	89,346	83,046	25,018	7,836	255,534
Number of Cancers	142	402	562	211	91	1,408
Abnormal Call Rate	12.5%	8.9%	7.8%	7.2%	8.2%	9.1%
Overall Cancer Detection Rate (per 1,000)	2.8	4.5	6.8	8.4	11.6	5.5
Positive Predictive Value of Screening Mammography	2.3%	5.1%	8.7%	11.9%	14.3%	6.1%
Core Biopsy Yield Ratio	15.0%	28.4%	43.7%	56.5%	54.4%	33.9%



Outcome Indicators: Cost

Breast Screening Outcome Indicators by 10-Year Age Groups: 2015

Outcome Indicators	Age at Exam					
Outcome mulcators	40-49	50-59	60-69	70-74	75+	All
Number of Exams	50,070	89,346	83,046	25,018	7,836	255,534
Number of Cancers	142	402	562	211	91	1,408
Abnormal Call Rate	12.5%	8.9%	7.8%	7.2%	8.2%	9.1%
Overall Cancer Detection Rate (per 1,000)	2.8	4.5	6.8	8.4	11.6	5.5
Positive Predictive Value of Screening Mammography	2.3%	5.1%	8.7%	11.9%	14.3%	6.1%
Core Biopsy Yield Ratio	15.0%	28.4%	43.7%	56.5%	54.4%	33.9%



Outcome Indicators: Cost – Benefit

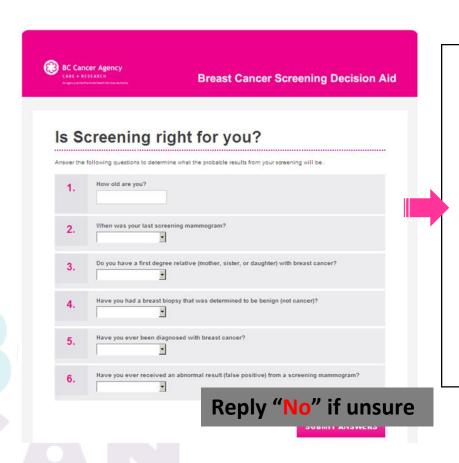
Breast Screening Outcome Indicators by 10-Year Age Groups: 2015

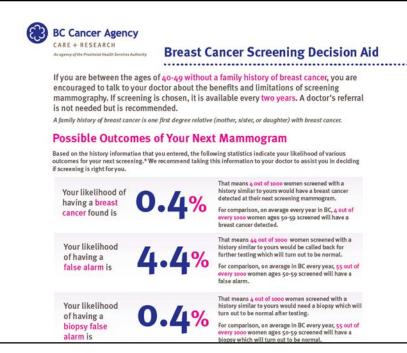
Outcome Indicators	Age at Exam					
Outcome indicators	40-49	50-59	60-69	70-74	75+	All
Number of Exams	50,070	89,346	83,046	25,018	7,836	255,534
Number of Cancers	142	402	562	211	91	1,408
Abnormal Call Rate	12.5%	8.9%	7.8%	7.2%	8.2%	9.1%
Overall Cancer Detection Rate (per 1,000)	2.8	4.5	6.8	8.4	11.6	5.5
Positive Predictive Value of Screening Mammography	2.3%	5.1%	8.7%	11.9%	14.3%	6.1%
Core Biopsy Yield Ratio	15.0%	28.4%	43.7%	56.5%	54.4%	33.9%



Online Decision Aid

Online Breast Cancer Screening Decision Aid - http://decisionaid.screeningbc.ca/





Overdiagnosis

- Screen-detected neoplasm which would never have become clinically apparent before patient's death
- Leads to Overtreatment
- Issue: cannot distinguish these cancers from those that will progress



Overdiagnosis: controversy

• Existence:



- Measurement issues
 - Disagreement re incidence (static vs increasing)
 - RCT not an option
- Range: 2% 48%
- Risk per Ca vs lifetime risk
- Radiology vs Pathology
- Determine your patient's tolerance

BC Cancer Breast Screening Policy Average Risk

- Referral not required
- Facilitate informed decision

Age	Policy
50 - 74	Recommended q2y Pt recall

BC Cancer Breast Screening Policy Average Risk

- Referral not required
- Facilitate informed decision

Age	Policy
40 – 49	Available q2y Pt recall
50 – 74	Recommended q2y Pt recall

BC Cancer Breast Screening Policy Average Risk

- Referral not required
- Facilitate informed decision

Age	Policy
40 – 49	Available q2y Pt recall
50 – 74	Recommended q2y Pt recall
75+	Available q2-3y No recall

BC Cancer Breast Screening Policy Higher Than Average Risk

- Higher risk:
 - -1st degree relative with Hx of breast cancer
- Referral not required
- Facilitate informed decision

Age	Policy				
40 – 74	Recommended q1y Pt recall				

BC Cancer Breast Screening Policy High Risk

- High risk:
 - High risk gene mutation (eg BRCA1/2), or untested 1st degree relative thereof
 - -Chest wall radiation at age 10-30
 - Very strong family Hx
- Referral required for 1st visit if <40y
- Facilitate informed decision

BC Cancer Breast Screening Policy High Risk

- Very strong family Hx
 - -2 cases of breast cancer in close female relatives (mother, sister, daughter, aunt, grandmother, great-aunt) on the same side of the family, both diagnosed before age 50
 - or 3 or more cases of breast cancer in close female relatives on the same side of the family, with at least one diagnosed before age 50.

BC Cancer Breast Screening Policy High Risk

- High risk:
 - High risk gene mutation (eg BRCA1/2), or untested 1st degree relative thereof
 - -Chest wall radiation at age 10-30
 - Very strong family Hx
- Referral required for 1st visit if <40y
- Facilitate informed decision

Participation and Retention

Many women are overdue each year, despite multiple recall notices

TABLE 5: RETURN RATES FOR WOMEN AGE 50 TO 69: 2012 - 2014

	First Screen		Subsequent Screen		Overall	
	Normal	Abnormal	Normal	Abnormal	Normal	Abnormal
Total Number to be Re-screened	21,155	4,473	431,686	28,319	452,841	32,792
Returned by 12 months	1%	1%	5%	4%	4%	4%
18 months	6%	7%	17%	17%	17%	16%
24 months	20%	20%	44%	41%	43%	38%
30 months	46%	41%	78%	69%	76%	65%
36 months	55%	50%	85%	77%	84%	73%

NOTE: SMP data extraction date: August 29, 2016.

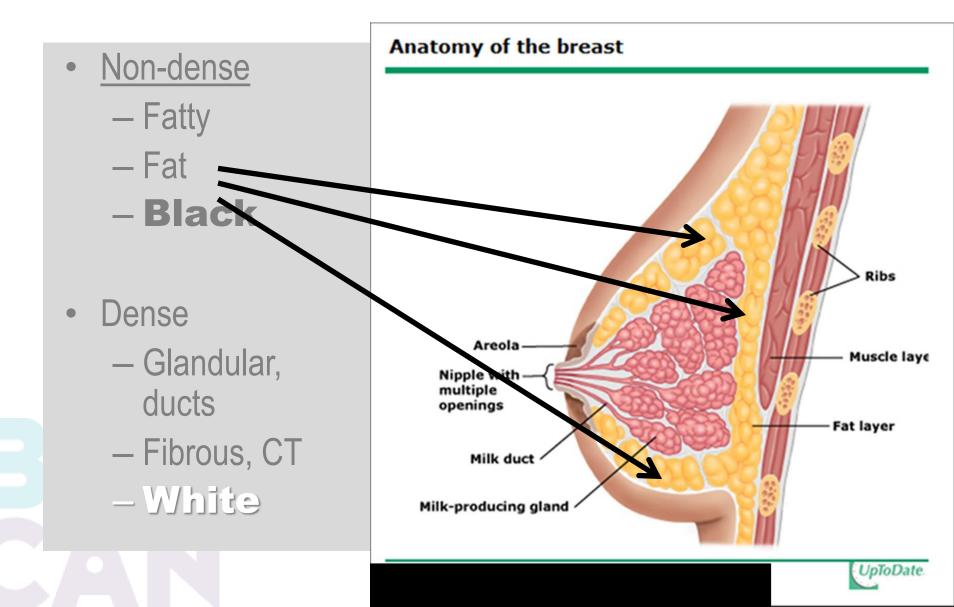
Looking Ahead



- Breast Density
- Other modalities
- Risk stratification/modification
- Personalized regimen



What is BD?



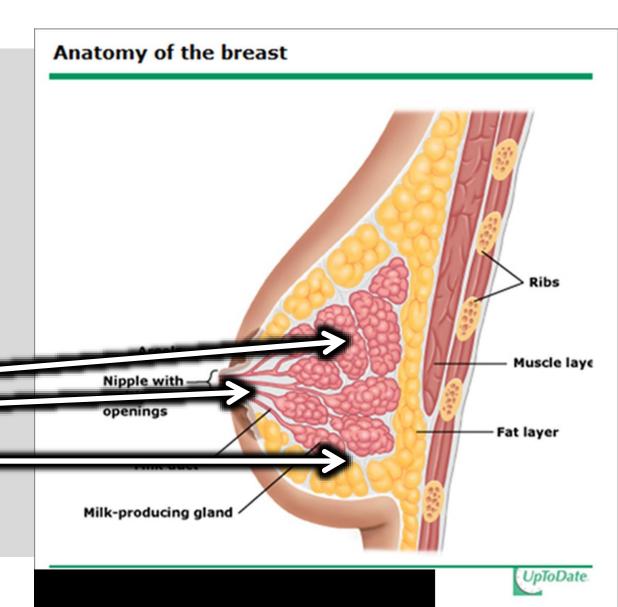
What is BD?



- Fatty
- Fat
- Black

• Dense

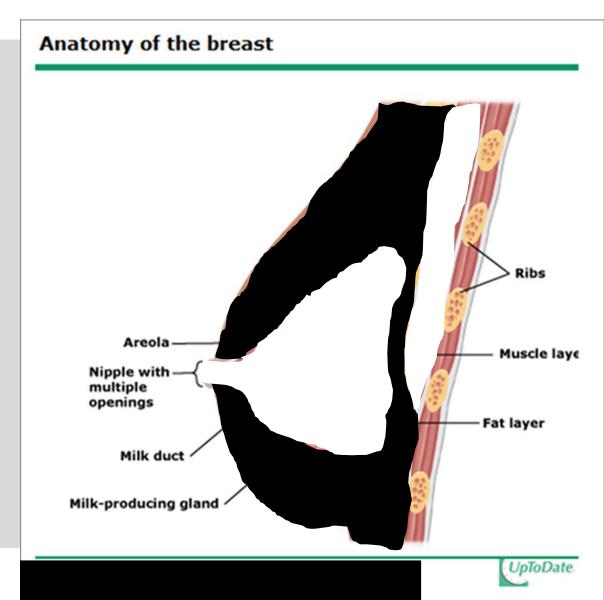
- Glandular,ducts
- − Fibrous, CT=
- -White

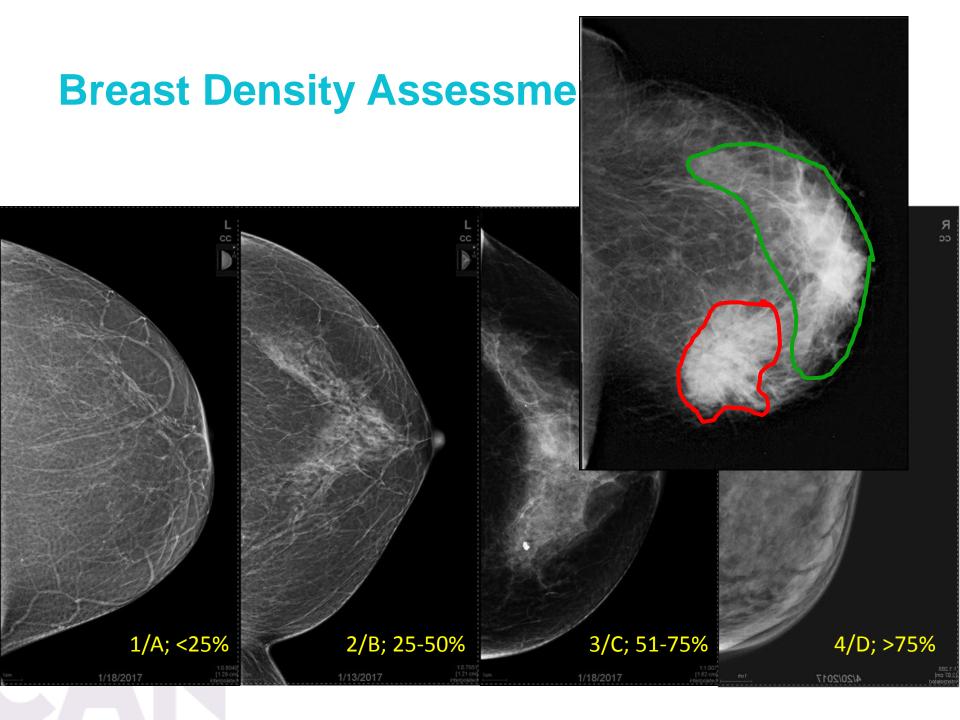


What is BD?

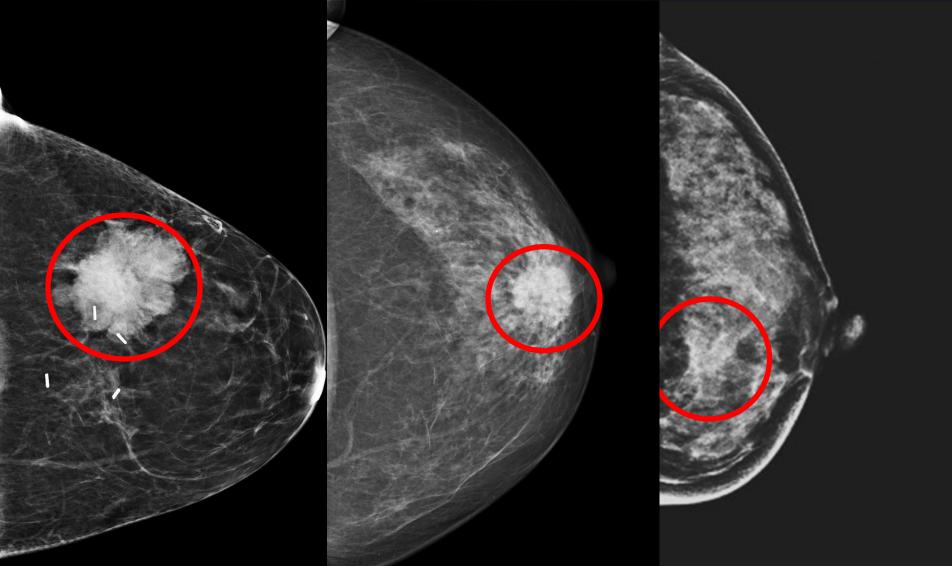
- Non-dense
 - Fatty
 - Fat
 - Black

- Dense
 - Glandular, ducts
 - Fibrous, CT
 - -White









BD Discussion Guide for Clinicians



Discussion Guide: Brez

Helping Patients Understand Breast Density and Their

The BC Cancer Breast Screening Program includes a breast density assessment v. This is sent to both providers and screening program participants. This guide be conversation with patients about breast density.

Breast Density

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

- Breasts are composed of two main types of tissue fibrogetissue appears dense on a mammogram, while fatty tissue appears.
- Breast composition (the amount of fibroglandular tissue and fatter change over time and from one mammogram to the next.
- · Most women's breasts become less dense as they get older

- Can change; tending to decrease with age
- Intro BI-RADS assessment of volume of dense tissue
- "breast composition" = "breast density"
- Intro masking/interval cancer and risk factor concepts
- "dense breasts" = C/D vs spectrum: C vs D; B

BI-RADS A

Almost entirely fatty

15% of BC population

95.1% mammographic sensitivity

Role of Mammography

- Women should continue to get regular screening.
- Mammograms are the only screening modality prove, from breast cancer. The ability of mammography to determine the control of the control
- It is important to remind your patients that no screening tes harder to find cancer on a mammogram.
- It is important to investigate all breast changes, even if a recent ma.

BI-RADS B

Scattered args of density

44% bulation

BI-RADS C

Heterogeneously dense, which may obscure small masses

34% of BC population

BI-RADS D

Extremely dense, which lowers the sensitivity of mammography

7% of BC population

Role of Mammography

- Continue regular mammo regardless of density
- Proven mortality benefit, density aside
- No screening test perfect, and density can mask
- Any breast changes remain important, even if negative mammo

Updated Discussion Guide

Risk of Breast Cancer Related to Breast Density and Other Ris

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 A woman age breasts (BIdevelopi 60-69

Among 1,0 BI-RADS D cal of new breast cal "Understanding Breast Density as a Risk Factor"

- Explain concept of Absolute Risk ("2y")
- Use 2 examples

DADCD / "bi-b" wiel

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



· Personal history of breast cancer.

Healthy lifestyle choices may help lower breast cancer risk. and an active lifestyle, limit alcohol, breastfeed if possible therapy for menopause symptoms. More information www.fiveplus.ca. There are a number of online took different combinations of these factors. Two risk

The Breast Cancer Risk Assessment Tool www.cancer.gov/bcrisktool

This tool does not include breast density informa-

"Additional Breast Cancer Risk Factors"

- Overall risk is complex combination of:
- Age, mutations, personal Hx, family Hx, Bx showing high risk lesion
- Lifestyle choices: active, wt, EtOH, breastfeeding, hormone ("5+")
- Risk calculator links: NIH (-BD); BCSC (+BD)

Updated Discussion Guide

"Relative Risk" explained

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 ge group.

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

TABLE 2 BY AGE

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	
- Ductal Intra-epithelial Neoplasia (DIN 1b) ³	5x*
- Lobular Intra-epithelial Neoplasia (LIN)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 ^t
BI-RADS D (extremely dense)	1.4xt

iscussion Guide Updat

Supplemental Testir

The purpose of breast s improved and the rist risk of breast canc

There is curre benefit from Task For supple

a ne propo lifetime). decrease br

A randomized st some of these ques supplemental ultrasou mammography such as i is available to individuals in rules for breast ultrasound thre

There is also limited evidence rega increase the value of supplemental te favourable for women with extremely d

"Supplemental Testing" (not "screening")

- Review purpose of screening: early cancer detection; not risk reduction
- Insufficient evidence for recommendation of *routine* supplemental for dense
- Does show additional cancer detection
- But unclear re overdiagnosis, proportion found at next screen, mortality
- RCT for US ongoing, but need to discuss benefits vs limitations (FP, sensitivity)
- Possible change balance for density in combination with other risk factors

More Information

We recognize that notifying should do next.

- Everyone who red information on bre
- Information about br www.screeningbc.ca/

References

- 1. Sickles, EA, D'Orsi CJ, Bassett LW, et al American College of Radiology; 2013.
- 2. Couch FJ, DeShano ML, Blackwood MA, e (20):1409-1415.
- 3. Singletary SE. Rating the risk factors for breas
- 4. Wen HY, Brogl E. Lobular Carcinoma in Situ. Su
- 5. Supplemental Screening for Breast Cancer in Wo 2016:164(4):268. Epub 2016 Jan 12.
- 6. https://canadiantaskforce.ca/guidelines/published-
- 7. Ohuchi, N. et al. Sensitivity and specificity of mammor Randomized Trial (J-START): a randomised controlled

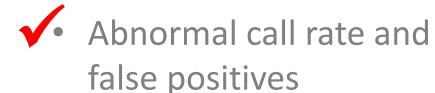
- 1. BC Cancer Breast Screening Program data used to calculate
- 2. Overall Sensitivity calculation includes DCIS and invasive breas
- 3. Absolute and relative risk calculated:
- a. For all program screens completed 2011-2015, with follow-up
- b. Includes digital and analog images.
- c. For invasive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

may be more

"More Information" Reminder that Patient Brochure enclosed with their screen results BC Cancer Screening Website link

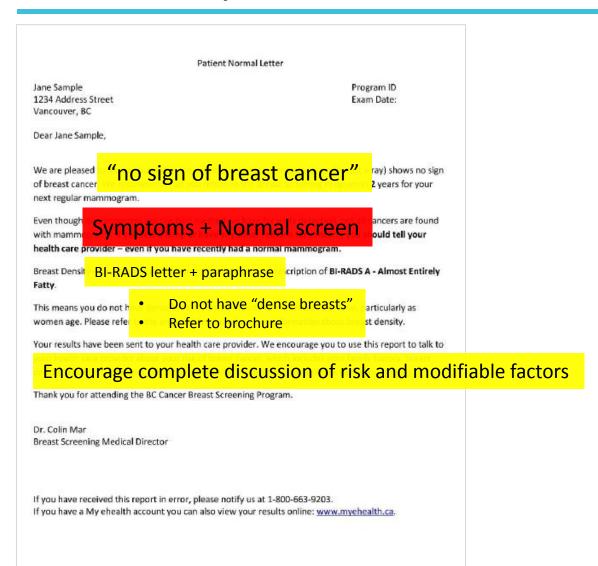
Markers of a successful screening test

- → Mortality
- → Advanced cancers
- ↑ Sensitivity ↓Interval ? Overdiagnosis cancers
- ✓ ↑Cancer detection rate



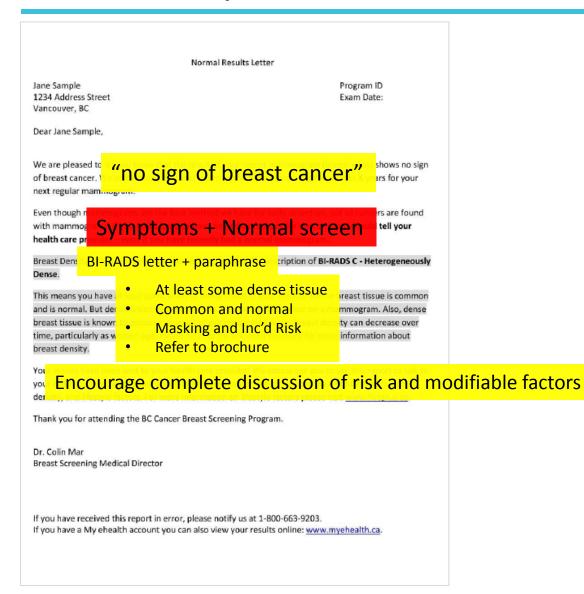


BI-RADS A/B Results Letter





BI-RADS C/D Results Letter





Updated Patient Brochure



What is breast density?

Breasts are made up of two main type f tissue – fibroglandular tissue and fatty tissue. I andult tissue appears dense on a mammogr

Why should I know my breast density?

- 1. Increased risk, but small impact on overall
- 2. Masking, so any symptoms still important



How do I know how much obreast tissue I have?

The amount of dense tissue in your breast measured by a radiologist using the Breas

Graphic demonstration of density

Combined with masking demonstration



entirely of non-dense

B Your breasts are composition of the breasts are composition of the breasts are composition.

What you can do

Are there additional screening tests available for those with dense breasts?

- Evidence limitations precluding definitive recommendation
- Other tests may find additional cancers
- Explain false positive risk

r ala a vilal I lua a vi ruas i la va a tra la va a itra

What is breast density?

- Comparison of 2 tissue types
- Normal, common

ue, but you should speak with your health e provider about your overall breast neer risk. it harder to find ormal dense st masses or nse tissue can it is important to

speak with your health care provider if you notice any changes in your breasts, even if you have recently had a normal mammogram.

How do I know how much dense tissue I have?

Introduce BI-RADS assessment



RADS composition categories
d to paraphrase

that other tests, such as breast ultrasound, may find additional cancers in individuals

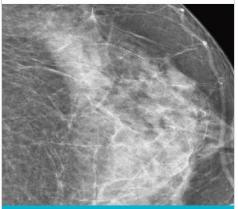
ant concepts

on mammo, not clinical change, particularly with age

www.screeningbc.ca/breast

Updated Patient Brochure





BI-RADS A Your breasts are composed almost entirely of non-dense (fatty) tissue.

BI-RADS B Your breasts are composed of mainly non-dense (fatty) tissue, with some scattered areas of dense tissue.

What is Breast De

Answering your or about breast den BI-RADS categor

Grade 6/7 reading level

Your breasts are composed of a mixture of non-dense (fatty) tissue and dense tissue.

Saraiya et al. Breast density notification letter and websites: are sts are composed of they too "dense"? J Am Coll Radiol 2019;16:717-723 tirely dense tissue.

www.screeningbc.ca/breast

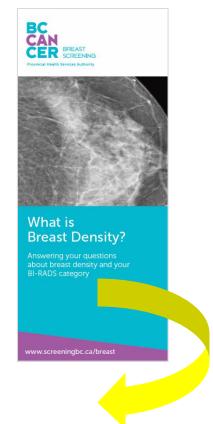
Updated Patient Brochure

"What you can do" continued:

- "If I have dense breasts, do I still need a mammogram?"
- "Besides getting regular mammograms, what else can I do?
 - "Be familiar with your breasts"
 - "Understand your overall risk for breast cancer" (≠ "high" risk)
 - "Make positive lifestyle choices" (5-plus)

"What else determines my risk for breast cancer?"

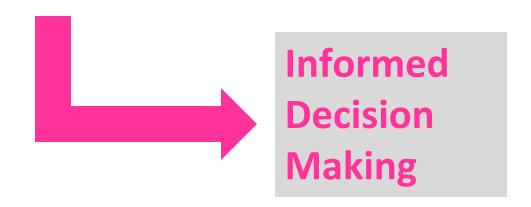
- Age
- Personal Hx of breast cancer
- Family Hx of breast cancer
- Inherited gene mutations



Looking Ahead



- Breast Density
- Other modalities
- Risk stratification/modification
- Personalized regimen



Summary

40—50-74—75+ Avg/Higher/High

Describe current BC breast screening guidelines;

Masking > Carcinogenesis Facilitate discussion: US?

 Summarize risks and investigations of patients with dense breasts; and

Identify at risk populations to increase screening uptake
 Post – pandemic

1st-degree FamHx

→ Path risk fx

Questions?

Colin Mar, MD

Medical Director

Breast Screening

BC Cancer

SMPmedicaldirector@bccancer.bc.ca

For more information on cancer screening...

Visit the BC Cancer Screening

Programs website: www.screeningbc.ca or

email screening@bccancer.bc.ca



Visit: http://ubccpd.ca/course/bca-screening-update

