Breast Cancer Screening:
Consensus and Controversies

Michael Morris, MD

Do you have a family member or friend with a history of breast cancer?

1. Yes
2. No

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2. No

	Common Types of Cancer	Estimated New Cases 2014	Estimated Deaths 2014
1.	Prostate Cancer	233,000	29,480
2.	**Breast Cancer (Female)**	**232,670**	**40,000**
3.	Lung and Bronchus Cancer	224,210	159,260
4.	Colon and Rectum Cancer	136,830	50,310
5.	Melanoma of the Skin	76,100	9,710
6.	Bladder Cancer	74,690	15,580
7.	Non-Hodgkin Lymphoma	70,800	18,990
8.	Kidney and Renal Pelvis Cancer	63,920	13,860
9.	Thyroid Cancer	62,980	1,890
10.	Endometrial Cancer	52,630	8,590

http://seer.cancer.gov/statfacts/html/breast.html

What is the probability of a 50 year old women having breast cancer in the next 10 years?

1. 2%
2. 12%
3. 20%

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http://seer.cancer.gov/canstat/animator

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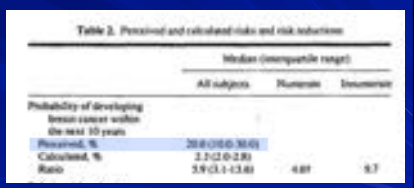

J Natl Cancer Inst. 1995;87(10):720-31

What is the risk of dying from early stage breast cancer?

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2. 10%
3. 20%
4. 30%

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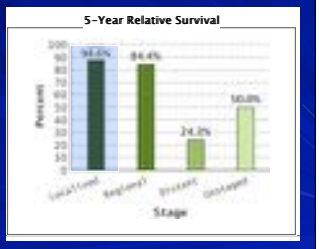

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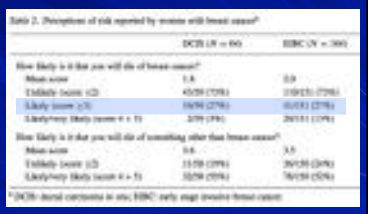

Breast Cancer Res Treat. 2003;77(3):285-93

Breast Cancer Screening

- Where there is consensus I say so
- Where there is controversy I say so
- Make your own informed decision

Perspective

Abolishing Mammography Screening Programs? A View from the Swiss Medical Board

My Advice:

- Stick with recommendations of major medical societies
  - *ACS* (American Cancer Society)
  - *NCI* (National Cancer Institute)
  - *USPSTF* (US Preventative Services Task Force)
  - ACP (American College of Physicians)
  - AAFP (American Academy of Family Physicians)
  - *ACR* (American College of Radiology)
  - *ACOG* (American College of Obstetrics & Gynecology

Methods of Breast Cancer Screening

- Physical Exam
  - Breast self exam
  - Clinical breast exam
- Imaging
  - Mammography
  - MRI
  - *Ultrasound*
  - *Tomosynthesis, molecular breast imaging, contrast mammography*
- *Blood biomarkers*

Definitions

- Screening Exam:
  - Look for breast cancer in asymptomatic women
- Diagnostic Exam:
  - Referred for specific concern
  - Palpable lump, focal pain, nipple discharge (*clear, bloody*)

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Case #1

- 41 y/o women comes for her annual exam
  - No PMH; No FH cancer
  - Occasional EtOH; non-smoker
- You perform routine exam, including clinical breast exam

Physical Exam Screening

CLINICAL BREAST EXAM

- Yes:
  - *ACS, NCI, ACOG*
- Insufficient data:
  - *USPSTF, AAFP*

BREAST SELF EXAM

- Yes:
  - *ACOG*
- No:
  - *USPSTF, AAFP, ACS, NCI*

Would you refer this patient for a screening mammogram?

- 41 y/o women comes for her annual exam
  - No PMH; No FH cancer
  - Occasional EtOH; non-smoker
- You perform routine exam, including clinical breast exam

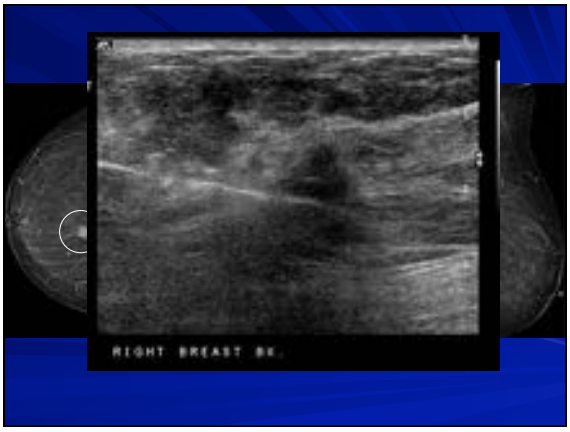
1. Yes
2. No

Consensus

- Only screening method to reduce mortality in RCT
  - Ages 40-74
- Overall ~20% mortality reduction
  - Sensitivity 84.9%
  - Specificity 90.3%

- Yes: *ACS, NCI, USPSTF, AAFP, ACOG, ACR, ACP*
- No: 0

Lancet. 2012; 380:1778-86
http://breastscreening.cancer.gov/data



Benefits of Screening vs **"Harms" of Screening**

Benefits of Screening

- 20% mortality reduction* → Very big benefits, few people
  - If 1000 women screened
  - Absolute decrease 5 → 4

"Harms" of Screening

Ann Intern Med. 2009;151:727-37
J Med Screen 2012:19 s1:42-56

Benefits of Screening

- 20% mortality reduction* → Very big benefits, few people
  - If 1000 women screened
  - Absolute decrease 5 → 4

"Harms" of Screening

- False Positives → Small harms, many people
  - ~10% recalled; ~1% biopsy
  - Anxiety, morbidity, cost
- High NNT when younger → Small harms, many people
  - 40-50: 1/1900
  - 60-70: 1/377

Ann Intern Med. 2009;151:727-37
J Med Screen 2012:19 s1:42-56

Benefits of Screening

- 20% mortality reduction* → Very big benefits, few people

"Harms" of Screening

- False Positives → Small harms, many people
- High NNT when younger
- Overdiagnosis → Big harms, very few people
  - ~1-20% women with cancer Rx unnecessarily

Ann Intern Med. 2009;151:727-37
J Med Screen 2012:19 s1:42-56

- When to start screening?
  - Age 40 or 50
- Screening frequency?
  - Yearly or biennial
- When to stop?
  - Age 75, 80, 85

Small harms, many people

Very big benefits, few people

Big harms, very few people

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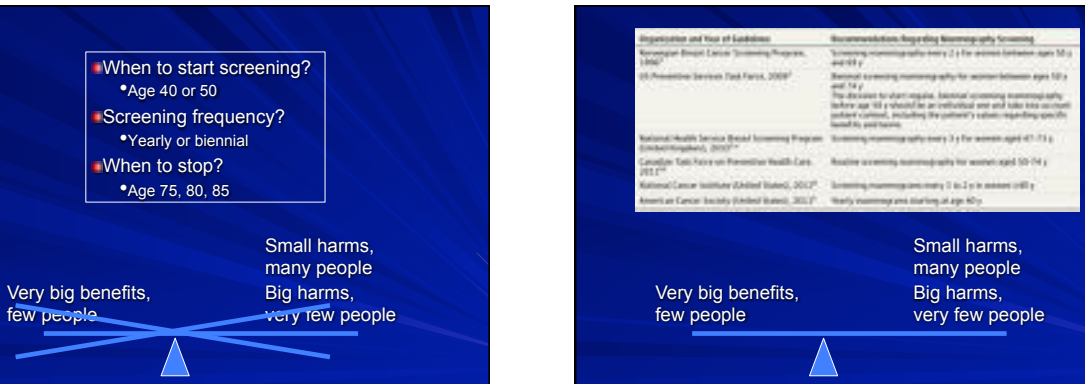

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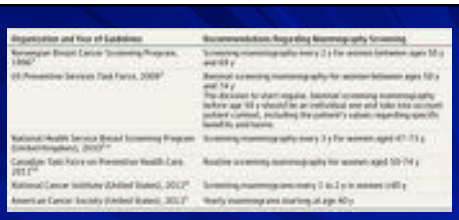
JAMA 2014;311(13):1327-35



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US Breast Cancer Mortality: 22/100,000

UK Breast Cancer Mortality: 24/100,000

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JAMA 2014;311(13):1327-35

When to Start Screening?
(average risk women)

Age 40	Wait until age 50
RCT trials start age 40	Breast Ca incidence is lower (high NNT)
15% mortality reduction* in women 40-49 • *relative decrease	Harms outweigh benefits • Increased stress from false positive mammogram • Increased biopsies
Yes: *ACS, NCI, ACR, ACOG*	Yes: *USPSTF, AAFP*

Ann Intern Med. 2007;146(7):511-5

When to Stop Screening?

- RCT data stop @ age 74
- Mortality benefit mammography 7-10 yrs
- Consider stop screening if:
  - Life expectancy <7-10yrs
  - Not willing to undergo f/u if abnrml mammo
  - *ACS, ACR, ACOG, AAFP*

JACR 2010;7:18-27

Case #2

- 35 y/o women, new patient visit
  - Healthy
  - Mom breast ca age 45
    - No other FH ca
  - G2P2, first birth age 32

Should you refer this patient for a screening mammogram?

- 35 y/o women, new patient visit
  - Healthy
  - Mom breast ca age 45
    - No other FH ca
  - G2P2, first birth age 32

1. Yes
2. No
3. Not Sure

Should you refer this patient for a breast MRI?

- 35 y/o women, new patient visit
  - Healthy
  - Mom breast ca age 45
    - No other FH ca
  - G2P2, first birth age 32

1. Yes
2. No
3. Not Sure

Case #2

- 35 y/o women, new patient visit
  - Healthy
  - Mom breast ca age 45
    - No other FH ca
  - G2P2, first birth age 32
- Is she at high risk for breast cancer?

Who is High Risk?

- ACS expert panel review of evidence
- High risk = 20-25% lifetime risk breast ca
  - Supplement mammography screening with MRI


American Cancer Society Guidelines for Breast Screening with MRI as an Adjunct to Mammography

CA Cancer J Clin 2007;57:75-89

When to Start High Risk Screening?

- BRCA or chest wall radiation
  - 10 years after chest wall radiation
  - Not before age 25
- Family history
  - 10 years before onset of cancer in relative
- MRI does not replace mammography

JACR 2010;7:18-27
J Clin Oncol. 2010; 28(9):1450-7

Who is High Risk?

20-25% Lifetime Risk:

- BRCA
  - Untested 1st degree relative
- Chest wall radiation 10-30 year old
- Li Fraumeni, Cowden
- Calculated lifetime risk by models (PMH, FH)
  - Gail
  - Tyrer-Cuzick
  - BRCAPRO

www.cancer.gov/bcrisktool/
CA Cancer J Clin 2007;57:75-89

Who is (Not) High Risk?

20-25% Lifetime Risk:

- BRCA
  - Untested 1st degree relative
- Chest wall radiation 10-30 year old
- Li Fraumeni, Cowden
- Calculated lifetime risk by models (PMH, FH)
  - Gail
  - Tyrer-Cuzick
  - BRCAPRO

Not recommended (<20% Lifetime Risk)

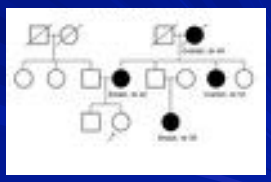
- Personal history breast cancer
- Increased breast density on mammography

www.cancer.gov/bcrisktool/
CA Cancer J Clin 2007;57:75-89

Who should be referred to genetic counseling?

NCCN Guidelines:

- 2 or more breast ca on same side of family
- Breast ca in 1st or 2nd degree relative <45 y/o
- Male breast ca
- Ovarian ca
- Gene mutation in susceptibly gene



J Natl Compr Canc Netw. 2009;7(10):1060-96

Case #3

- 53 y/o women calls your office
  - Mammogram report states: "dense breasts, which can lower the sensitivity of mammography"
- "What does this mean?"
- "Do I need additional testing?"

Breast Density

Entirely fat (~10%)
Sens: 88.2
Spec: 96.5

Scattered fibroglandular (~40%)
Sens: 82.1
Spec: 93

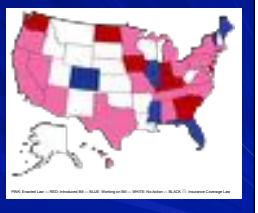
Heterogeneously dense (~40%)
Sens: 68.9
Spec: 90.8

Extremely dense (~10%)
Sens: 62.2
Spec: 89.9

Ann Intern Med 2003;138:168-175

Breast Density – Emerging Controversy

- Higher breast density
  - lower sensitivity
  - Independent risk factor? (~2-4x)
- Mandated reporting



- Your mammogram indicates that you have dense breast tissue. Dense breast tissue is common and is found in 50% of women. However, dense breast tissue can make it difficult to detect cancers in the breast by mammography and may also be associated with an increased risk of breast cancer. This information is being provided to raise your awareness and to encourage you to discuss with your health care providers your dense breast tissue and other breast cancer risk factors. Together, you and your physician can decide if additional screening options are right for you.

Summary

Consensus

- Clinical breast exam
- Screening mammography in average risk women
- Screening mammography & MRI in high risk women

Controversy

- When to start?
- How often?
- When to stop?
- Breast density?

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Future

- Standardization → Individualization
  - Screening based on density
    - Fatty breasts screened less often?
  - New technologies
    - Tomosynthesis (3D mammography)
    - Automated breast ultrasound
    - Molecular imaging & genomics