Disclosures

- None considered COI or required disclosures per prior review with ACP Senior Vice-President for Education.
  - Co-direct ACP board review course (Honoraria)
  - Co-author 3 *UpToDate* chapters and related App (Royalties)

J Wipf, MD, MACP

Breast Care Cases from a Primary Care Perspective

ACP Washington Chapter
Board Review Course
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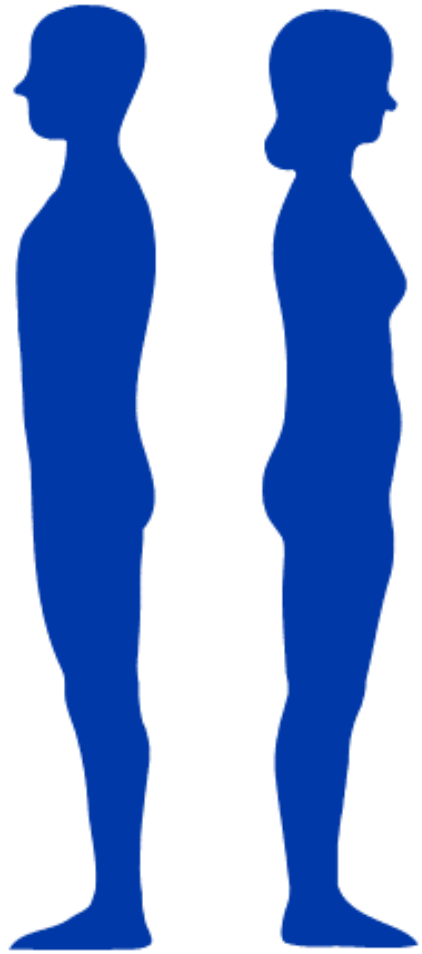
Joyce Wipf, MD, MACP
UW Professor of Medicine
Section Chief of GIM, VA Puget Sound, WHC/PCC

Guidance on talk & handout adapted from
Kristine Rinn, MD, Breast Care Oncologist

Estimated New Cancer Cases* in the US in 2021

Males 970,250	
Prostate	26%
Lung & bronchus	12%
Colon & rectum	8%
Urinary bladder	7%
Melanoma of the skin	6%
Kidney & renal pelvis	5%
Non-Hodgkin lymphoma	5%
Oral cavity & pharynx	4%
Leukemia	4%
Pancreas	3%
All other sites	20%

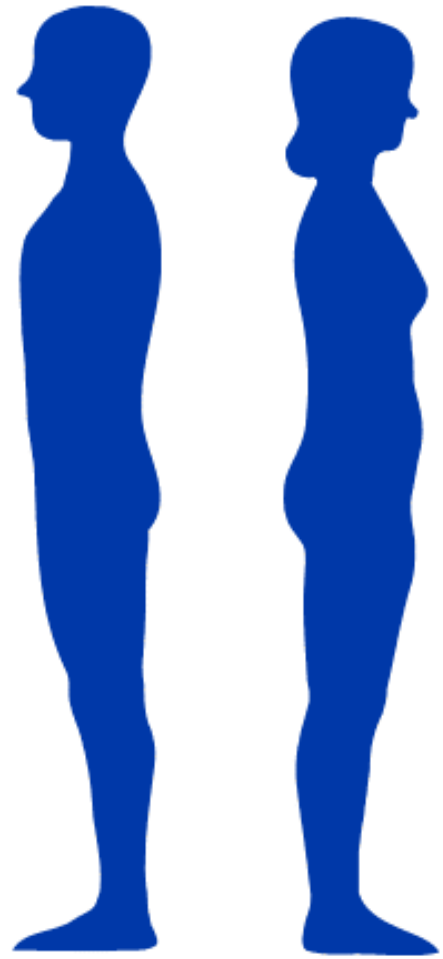


Females 927,910	
30%	Breast
13%	Lung & bronchus
8%	Colon & rectum
7%	Uterine corpus
5%	Melanoma of the skin
4%	Non-Hodgkin lymphoma
3%	Thyroid
3%	Pancreas
3%	Kidney & renal pelvis
3%	Leukemia
21%	All other sites

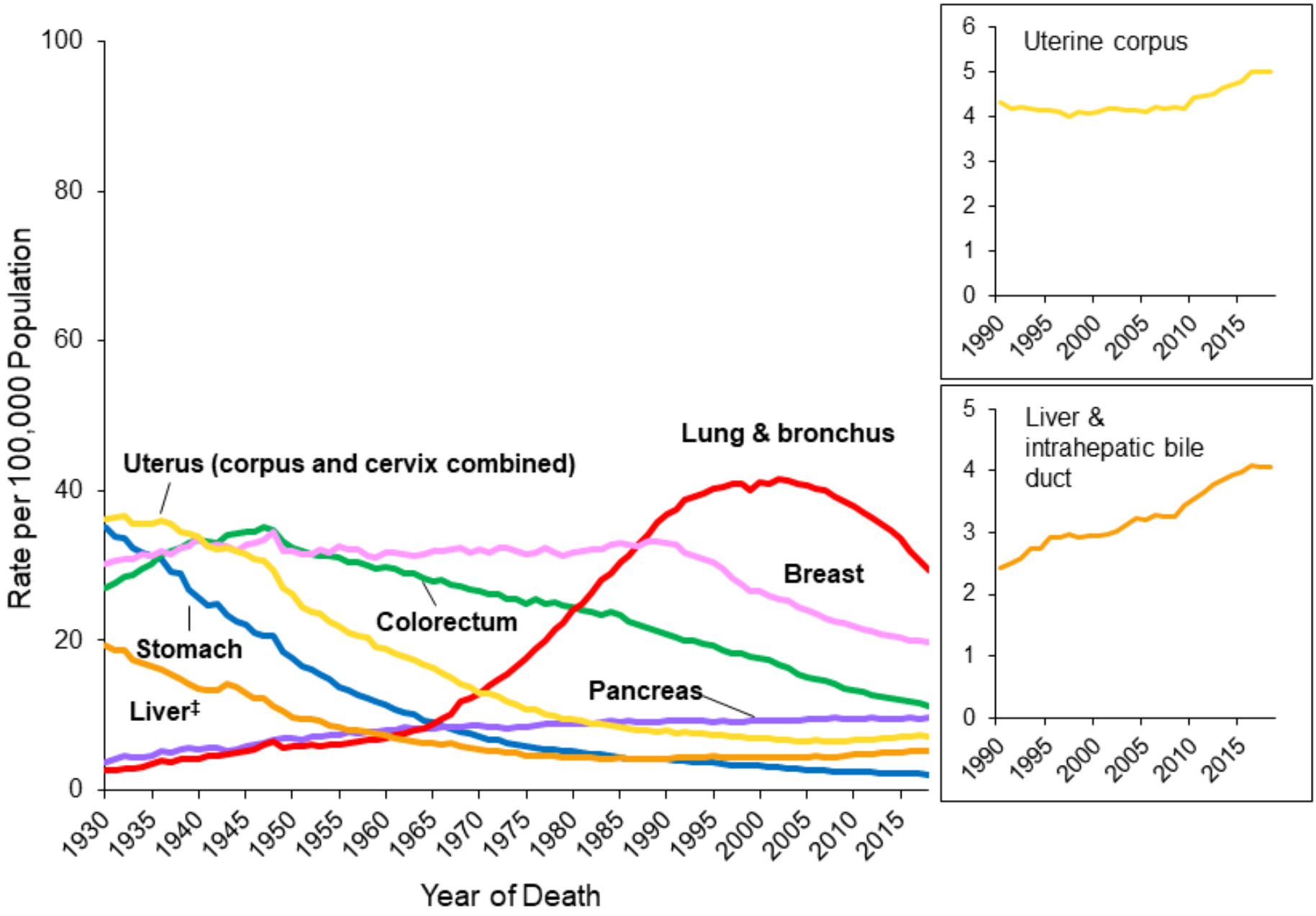
*Excludes basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

Estimated Cancer Deaths in the US in 2021

Males 319,420		Females 289,150	
Lung & bronchus	22%	22%	Lung & bronchus
Prostate	11%	15%	Breast
Colon & rectum	9%	8%	Colon & rectum
Pancreas	8%	8%	Pancreas
Liver & intrahepatic bile duct	6%	5%	Ovary
Leukemia	4%	4%	Uterine corpus
Esophagus	4%	3%	Liver & intrahepatic bile duct
Urinary bladder	4%	3%	Leukemia
Non-Hodgkin lymphoma	4%	3%	Non-Hodgkin lymphoma
Brain & other nervous system	3%	3%	Brain & other nervous system
All other sites	25%	26%	All other sites

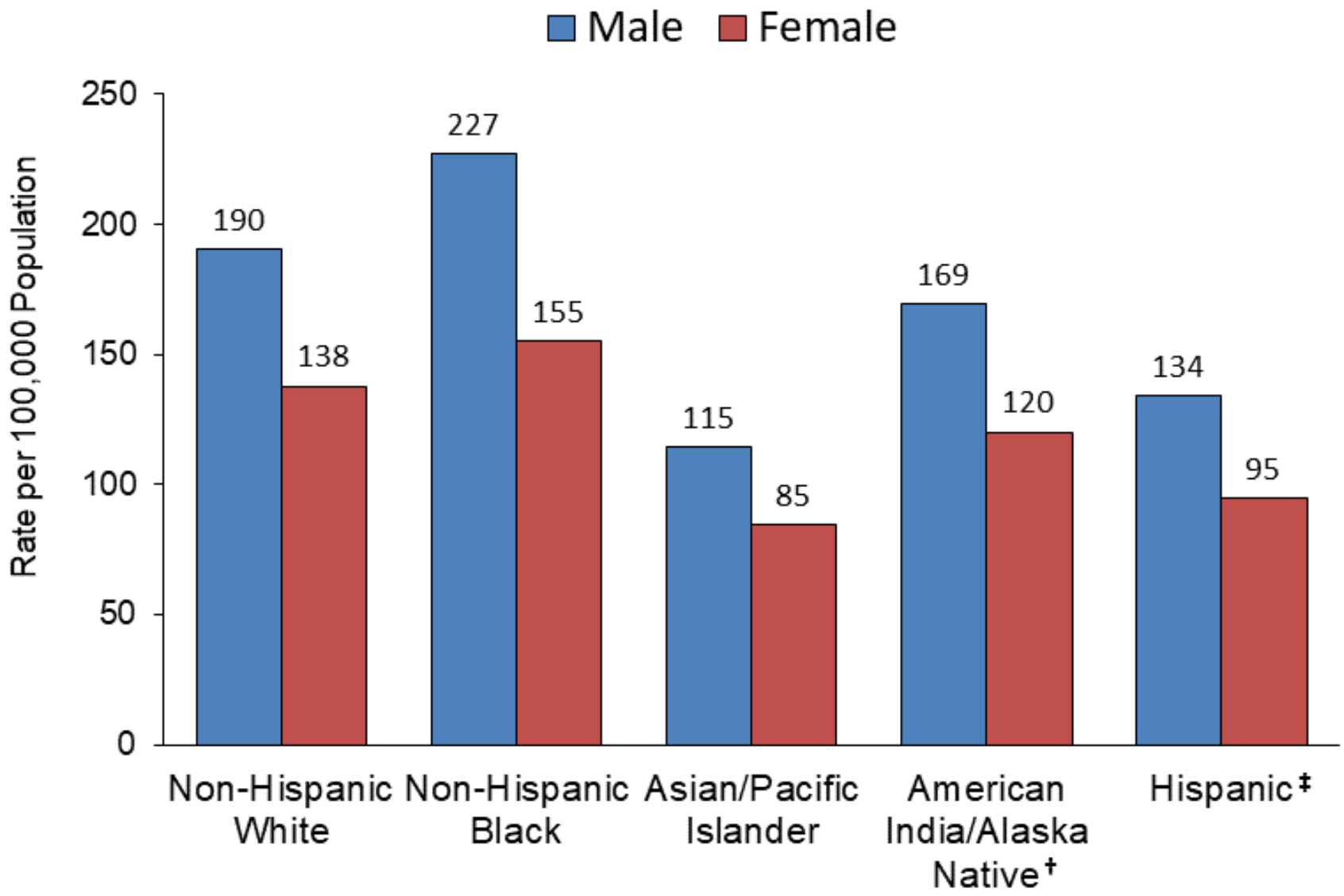


Trends in Cancer Death Rates* Among Females, US,1930-2018



*Age-adjusted to the 2000 US standard population. †Includes intrahepatic bile duct, gallbladder, and other biliary.
NOTE: Due to International Classification of Diseases coding changes, numerator information for colorectal, liver, lung, and uterine cancers has changed over time.
Source: National Center for Health Statistics, Centers for Disease Control and Prevention, 2020.

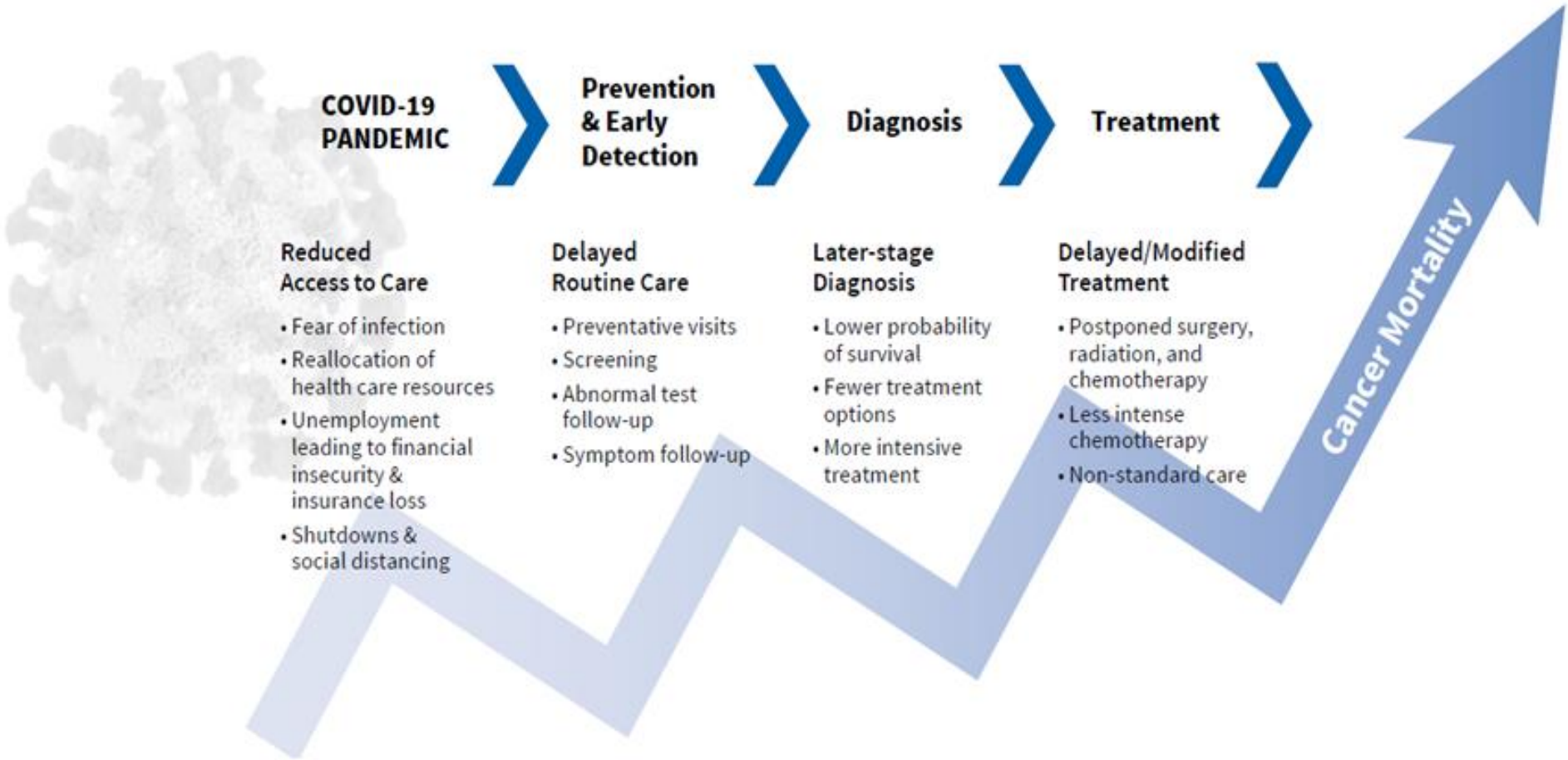
Cancer Death Rates* by Race and Ethnicity, US, 2014-2018



*Per 100,000, age-adjusted to the 2000 US standard population. †Data based on Purchased/Referred Care Delivery Area counties. ‡Persons of Hispanic origin may be of any race.

Sources: National Center for Health Statistics, Centers for Disease Control and Prevention, 2020.

Potential Impact of the COVID-19 Pandemic on Future Cancer Outcomes



Coronavirus image courtesy of CDC.

Breast Cancer

- Most common cancer in women
- Lifetime risk 12% or 1 in 8
- 2nd most common cause of cancer death in women, #1 cause age 45-55
- Median age of dx 61
- 75% of breast cancers dx after age 50
- 25-30% cases are *in situ* of mammographically-detected cases
- Mortality decreased past two decades

Accepted Risk Factors for Development of Breast Cancer

Patient features	Hormonal	Other

• Sex
• Age
• Ethnicity
	• Prolonged menstrual life:
	  • Nulliparity
	  • Early menarche
	  • Late menopause
	• Estrogens/ Progestin HRT (1.26 HR WHI)
		• Family history
		• Prior cancer
		• Radiation exposure

Breast Cancer Risk Factors

Race/Ethnicity

- most common in Caucasians
- higher mortality in African Americans*
  - later stage at diagnosis
  - more ER- disease
  - earlier age peak

- *In the U.S. population, African American women have a higher death rate than White non-Hispanic women for all-cause, heart disease, and cancer mortality.

- Among VA healthcare users, African American women Veterans do not experience the racial disparities in mortality that are present for women in the U.S. general population.
  Source: Wong MS,…Washington DL. Health Equity 2019;3(1).

Case 1.

- ***Which of the following is associated with the highest risk of breast cancer?***

A. Proliferative lesions (Hyperplasia)
B. Fibrocystic breast disease
C. Proliferative lesions with atypia
D. Fibroadenoma

Breast Cancer Risk Factors

Benign Breast Disease

- **non-proliferative changes NOT associated with increased risk**

- proliferative lesions (hyperplasia) 1.3-2 RR
- proliferative lesions with atypia 4-6 RR or more

Breast Cancer Risk Factors: Postulated but unproven

- Obesity
- Exercise (decreased risk post-menopausal
- High fat diet
- Low Vitamin D
- ETOH (dose-dependent increased risk)

Case 2.

- A 58 yr old woman with history of melanoma in-situ has this family history:
  - one sister lung cancer at 63 (smoker)
  - another sister had breast cancer age 65
  - father prostate cancer age 80s
  - mother alive, CV disease age 78
  - 3 other sisters with no history of cancer
  - 2 daughters no cancer
  - Ethnicity is Caucasian

She is concerned cancer “runs in her family” and would like to have a “gene test”.

Case 2.
What is the best advice?

A. Have blood tested for BRCA1/2 mutations
B. Encourage her unaffected children to have BRCA1/2 mutation testing
C. Advise her children to start screening routine cancer screening tests immediately (mammogram, colonoscopy, PSA)
D. Advise her that genetic testing is unnecessary and recommend she and her family continue screening/risk reduction as for the general population
E. Recommend bilateral prophylactic mastectomies and oophorectomy for women in the family

Case 2.

This family has a pattern of cancers which are typically sporadic in these age groups and not likely associated with a dominant gene mutation.

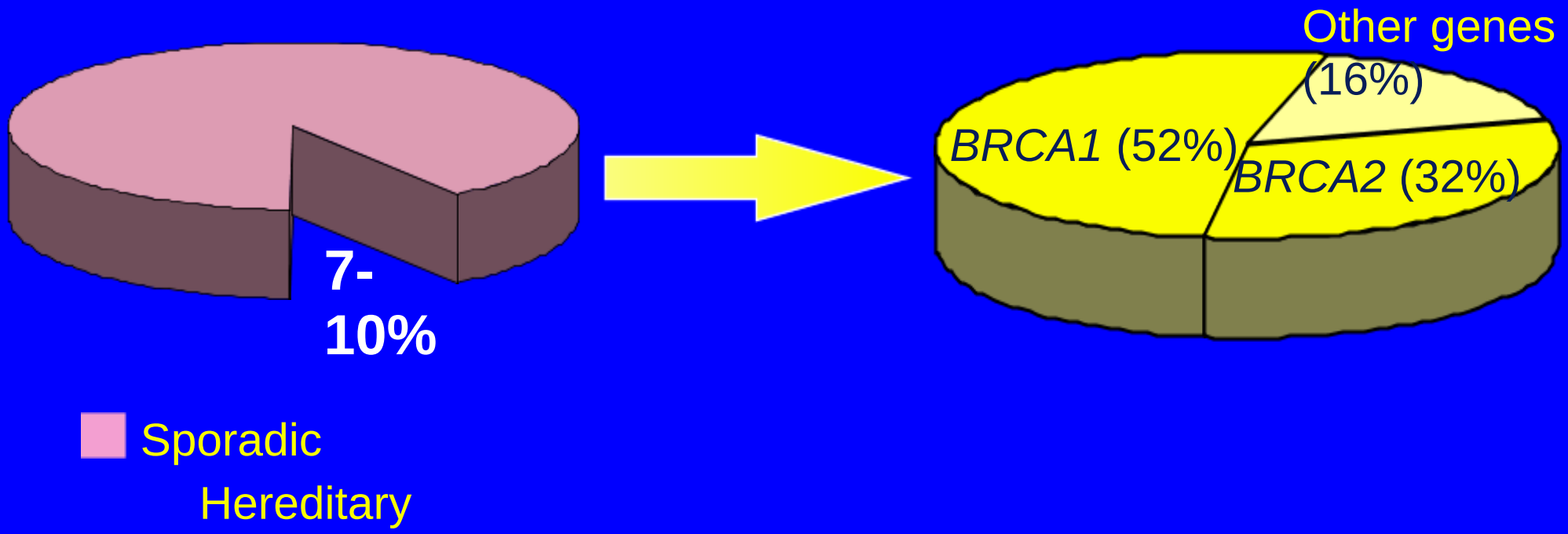
Age of onset, high number of non-affected individuals and lack of high-risk ethnicity support this.

Case 3.

A 32-year-old female pt is informed that her maternal aunt aged 42 was diagnosed with cancer and has BRCA+ mutation.
The patient's mother died of suicide age 50, no known cancer. The pt has no siblings.
What is her risk of having the mutation?

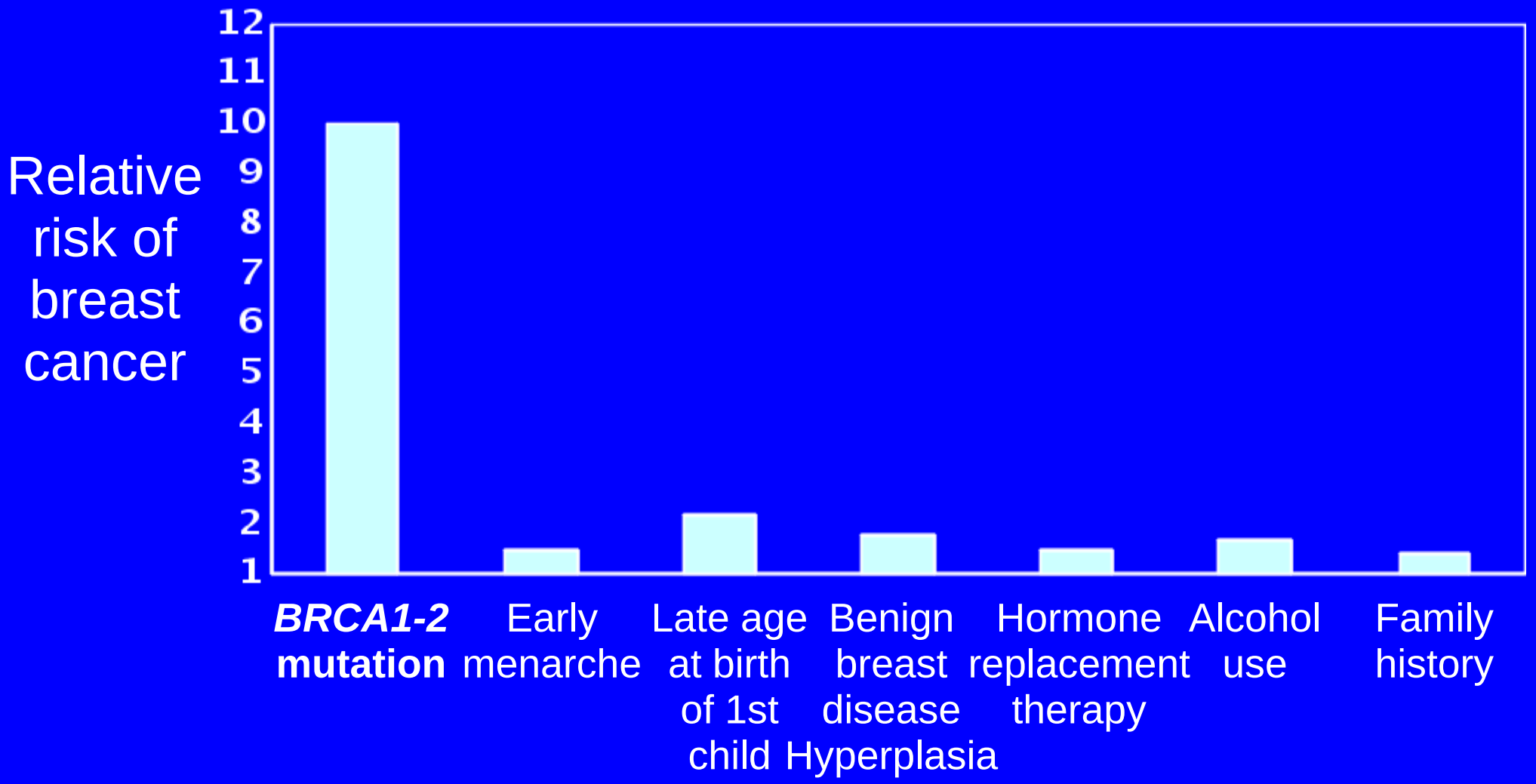
A. <10%
B. 25%
C. 50%
D. Unable to calculate risk

Hereditary Breast and Ovarian Cancer



***Am J Hum Genet* 1998;**
62:676-89

BRCA1-2 Mutations Increase the Risk of Cancer More Than Other Factors



BRCA1-2 Mutations Increase the Risk of Early-Onset Breast Cancer

	By age 40	By age 50	By age 80
Population Risk	0.5%	2%	12%
Hereditary Risk	10%-20%	33%-50%	56%-87%

BRCA 1

Autosomal dominant

Chromosome 17q21

Breast Cancer risk: 51% at age 50
85% at age 70

Ovarian cancer risk: 23% at age 50
63% at age 70

Other Cancers

BRCA 2

Autosomal Dominant
Chromosome 13

Early Breast Cancer

Ovarian Cancer

Male Breast Cancer

Melanoma

Other Cancers

Case 3.

Other points

If a patient presents with concern about a mutation given a first degree relative with cancer, it always makes the most sense to first test a member of the family for BRCA1/2 testing who has had the disease. Otherwise it's difficult to interpret a negative test in an unaffected relative.

Mutations are autosomal dominant and can just as easily be passed through the paternal side.

Case 3

Other points

If a patient presents with concern about a mutation given a first degree relative with cancer, it always makes the most sense to first test a member of the family for BRCA1/2 testing who has had the disease. Otherwise, it is difficult to interpret a negative test in an unaffected relative.

Mutations are autosomal dominant and can just as easily be passed through the paternal side.

When obtaining FH, don't forget to ask about ovarian cancer (example pt age 44, no FH breast CA but 2 family members with ovarian)

Hereditary Breast Cancer

BRCA1/2 Mutations

- much more common in certain ethnic or geographic groups (Ashkenazi Jewish, Icelandic)

Other mutations

- Cowden Syndrome (PTEN)
- Li Fraumeni (P53)
- CHEK 2

Case 4.

- A 44-year-old woman presents for her annual women's health evaluation. She notes a small lump in the right breast for a few months.
  PMH: menarche age13, G1 P1 age 34, Rx OCPs x 15 yrs.
  Family Hx negative for cancer.
  Exam: asymmetric breast with 1cm lump right breast. No adenopathy.
  Diagnostic Mammogram is negative.

Case 4.

What would be the most appropriate next step in management?

A. Breast MRI
B. Reassurance that because her family hx is negative and mammogram is negative, no additional studies or treatment required.
C. Measurement of circulating tumor markers, including CA15-3 and CEA
D. Breast ultrasound and referral to a surgeon experienced in breast disease

Case 4.

Ultrasound and consultation with a surgeon experienced in breast disease. A negative mammogram is not sufficient to discontinue evaluation of a suspicious breast finding:

- Diagnostic accuracy of mammogram in patients with confirmed cancer is 84% per several studies (Data: Elmore J, others)

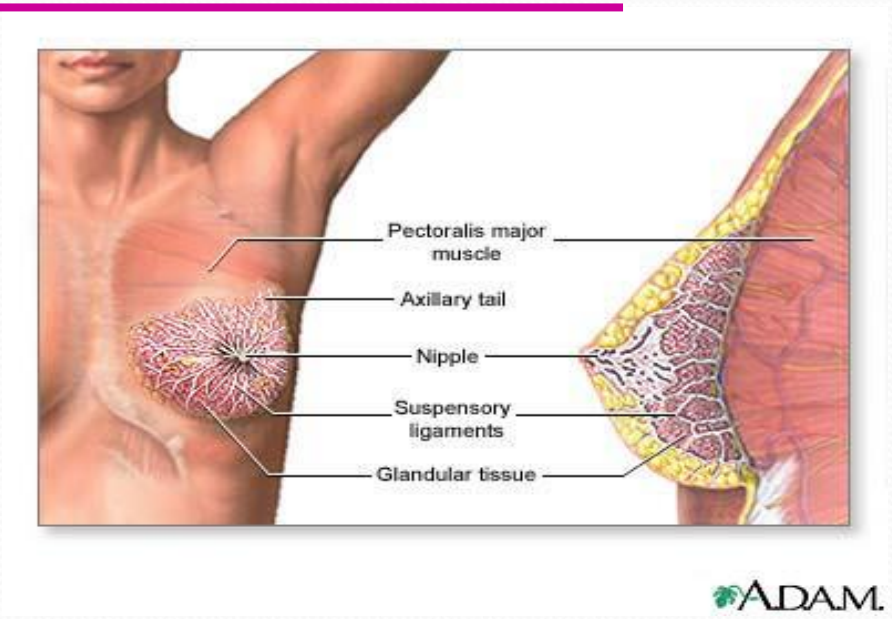
TAKE HOME POINT:

A patient with persistent lump must have further workup even if negative mammogram

- **Triad of mammogram, US and biopsy**

Breast Cancer Diagnosis- Physical Exam

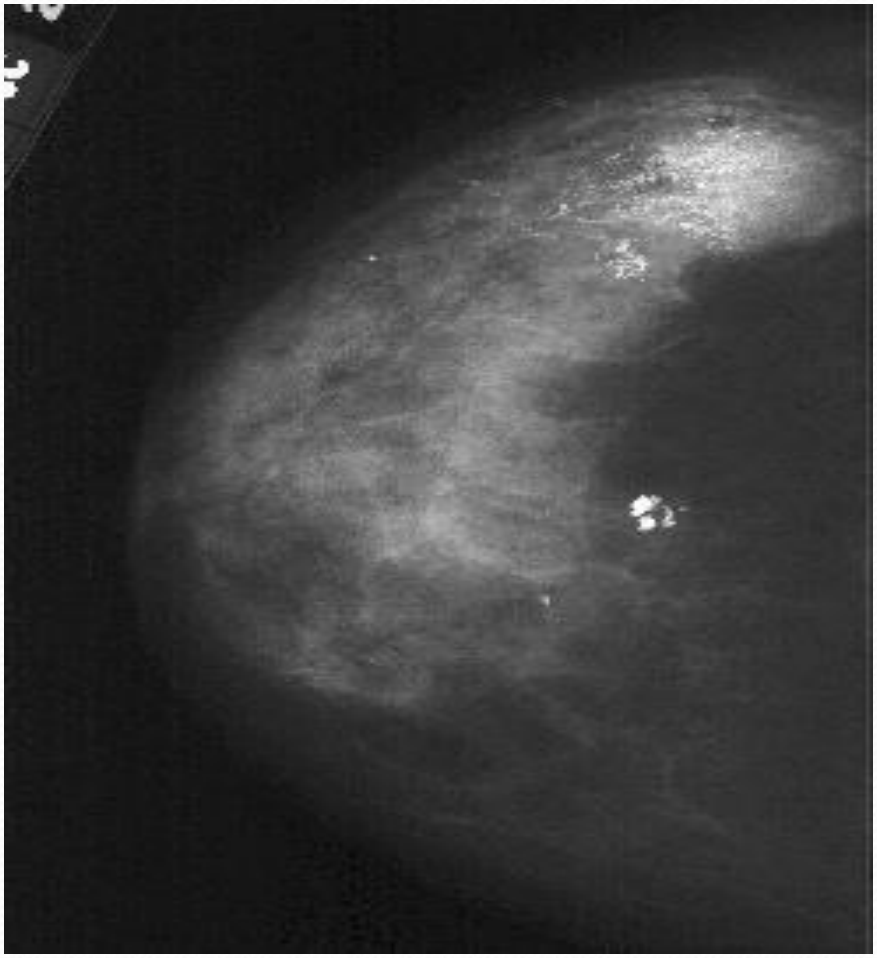
- masses, thickening
- nipple inversion
- adenopathy
- peau d'orange
- dimpling



- usually painless, but not always
- aim for concordance of radiologic, physical exam and biopsy findings
- low threshold for surgical referral

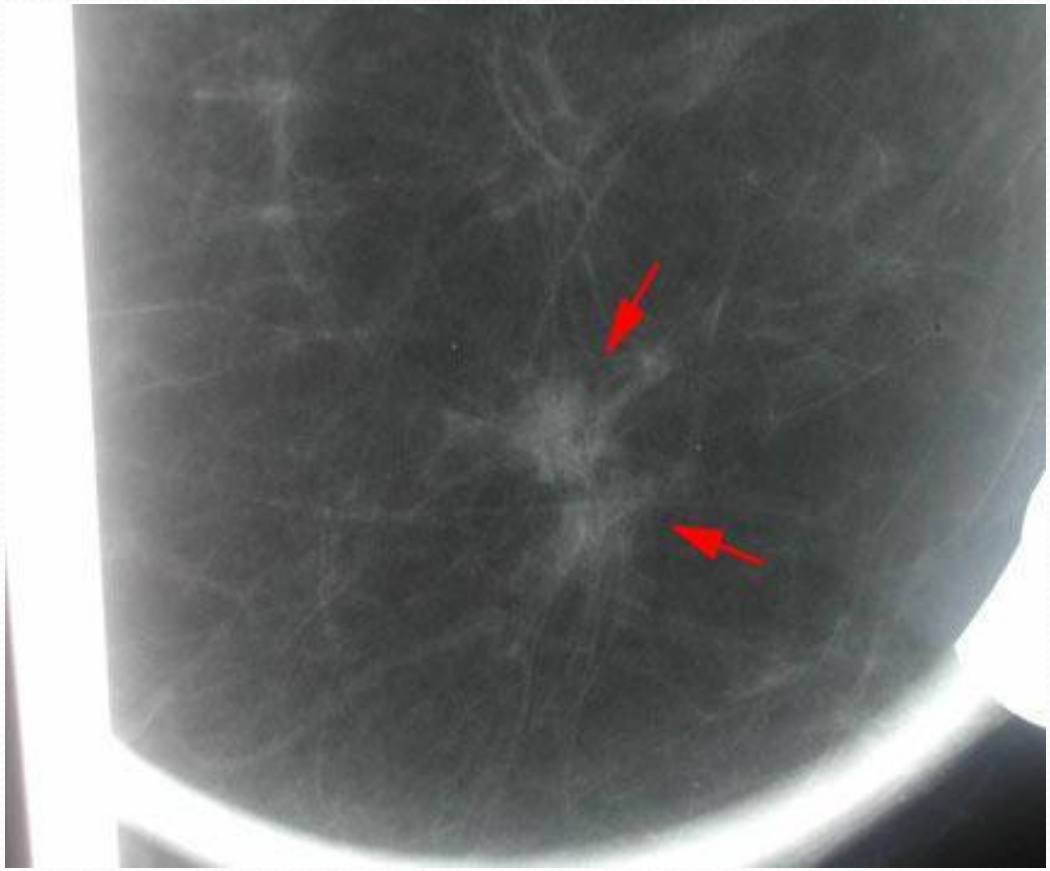
Mammographic Findings

Abnormal branching, pleiomorphic calcifications are the hallmark of DCIS



Mammographic Findings

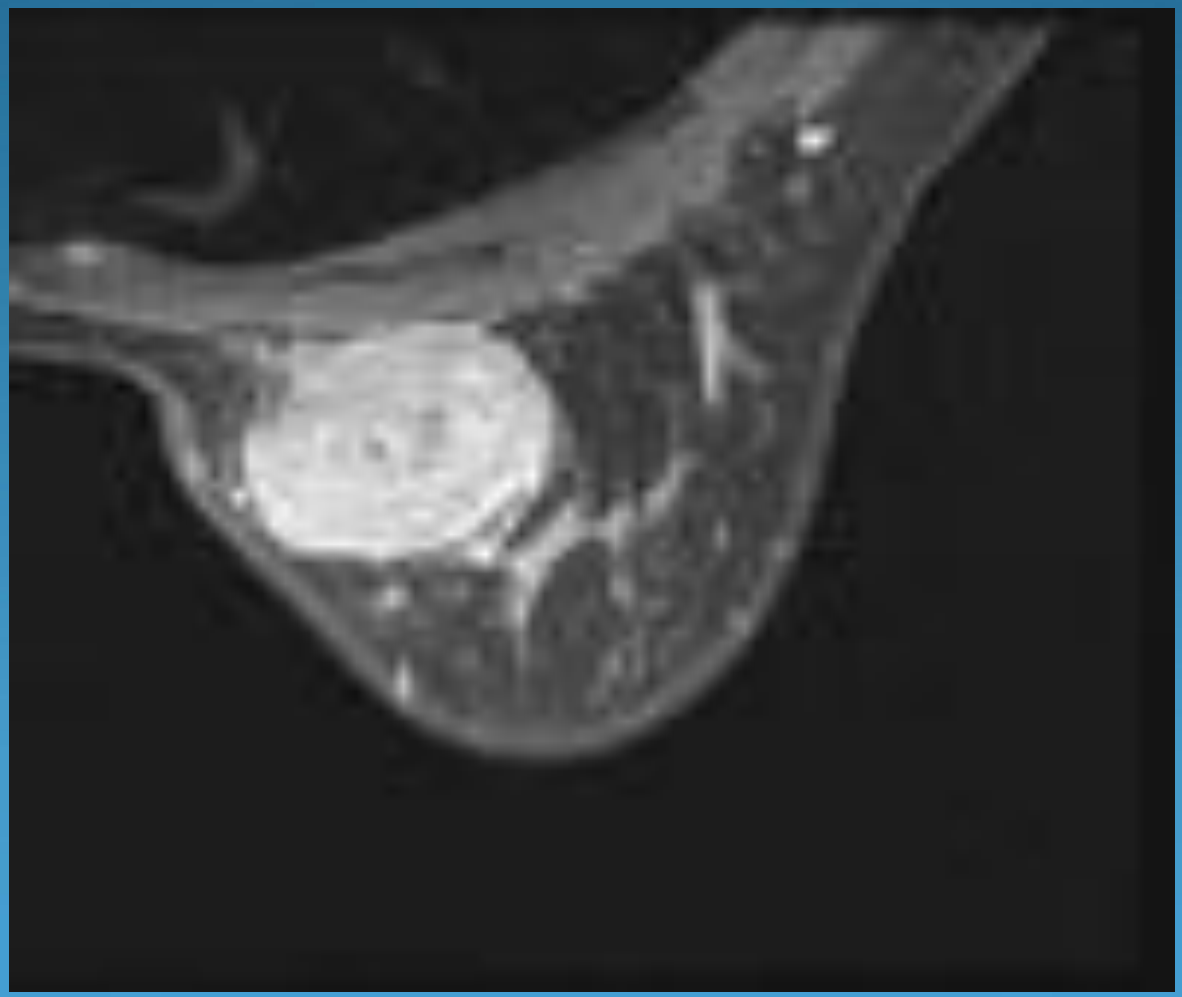
Classic spiculated mass showing invasive breast cancer



Ultrasound

- important diagnostic tool for w/u of palpable abnormalities
- masses should always be evaluated by ultrasound even if mammogram negative
  - Mass evaluation need the triad of mammogram, US and biopsy before diagnosis of benign mass.
- US not a widely accepted screening tool

Breast MRI



Indications for Breast MRI

- Contralateral disease (4-5% at diagnosis)
- Chest wall involvement
- High risk screening (genetic mutation, >20-25% lifetime risk)
- Hx chest irradiation between ages 10-30
- Mass with other studies unclear

Indications for Breast MRI - 2

- Lesion characterization
- Preoperative therapy
- Infiltrating lobular carcinoma
- Extent of disease in breast conservation
- Certain types of Implants /reconstructed breasts (radiologist provides guidance)

Breast Cancer Pathology

NON-INVASIVE

Ductal Carcinoma *in situ*

Lobular Carcinoma *in situ*

INVASIVE

Infiltrating Ductal Carcinoma (75%)

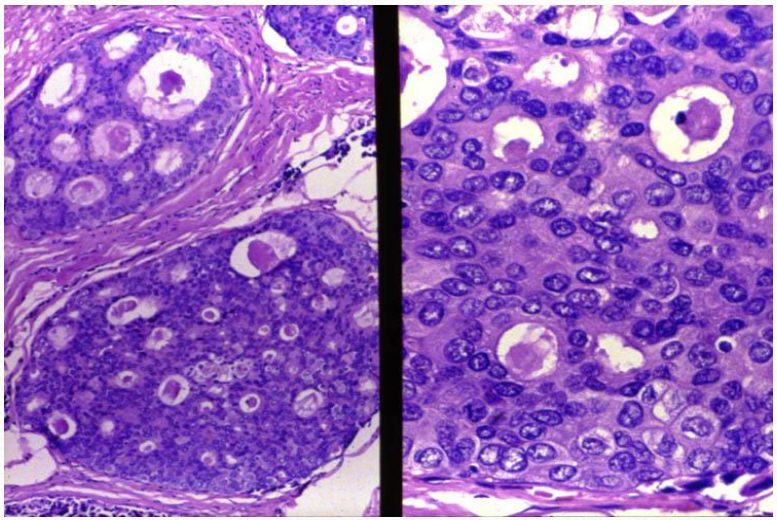
Invasive Lobular Carcinoma (5-10%)

Favorable subtypes (5%): tubular, mucinous (colloid), papillary)

Rare aggressive subtypes:

- **Medullary Carcinoma (?BRCA1)**
- **Inflammatory**
- **Metaplastic (ER neg)**

Paget's Disease of the breast



Case 5

- A 43 yr old woman is found to have a localized area of calcifications on mammogram, not present on mammogram one year earlier. Exam without palpable mass, lymph nodes are clinically negative.

  Biopsy shows DCIS, ductal carcinoma in situ on pathology.

Case 5.
What is the standard recommended treatment for DCIS (ductal carcinoma in situ)?

A. Lumpectomy and radiation
B. Lumpectomy followed by chemotherapy
C. Tamoxifen and chemotherapy
D. Lumpectomy with lymph node dissection
E. Close observation for progression as this is not invasive cancer

Lumpectomy vs. Mastectomy

- **Breast conservation** (lumpectomy + radiation) has improved cosmetic outcomes over mastectomy with **equivalent survival**

  - Lumpectomy alone associated with unacceptable local recurrence risk, thus need radiation also
  - Noted controversies in DCIS

Lumpectomy vs. Mastectomy

- **25%** of women are not candidates for breast conservation
  - Large primary tumor
  - Multicentric disease
  - Inflammatory breast cancer
  - Patient preference (especially in setting of high genetic risk)
  - Contraindication to radiation

Pathology of DCIS

- **DCIS-ductal carcinoma in situ**
  - Cancer cells contained with the basement membrane of the milk duct
  - Incidence increasing because of screening
    - Risk of progression to invasive cancer: 14-53% (Rx like CA)
  - Prognosis excellent
  - Standard: treated locally with mastectomy or lumpectomy/radiation
    - Controversies re: Rx since is not invasive: Small studies underway: lumpectomy only, watchful waiting
  - No role for chemotherapy
  - +/- role for tamoxifen

Predictive and Prognostic Factors

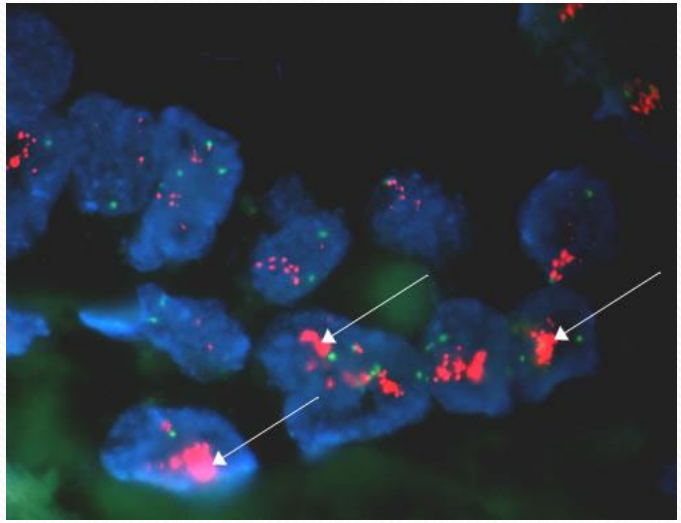
- **Tumor biology:**
  - Hormone receptor expression
    - Ductal CA 2/3 ER/PR+; most lobular ER/PR+
  - Grade/proliferation rate
  - HER2/neu overexpression
    - Negative prognosis
  - Genomic profiling:
    - 21 gene array “Oncotype Dx”
    - 70 gene array

HER2 expression

- Transmembrane receptor with tyrosine kinase activity
- Overexpressed in 25% of breast cancers
- Poor prognosis
- Predictive of response to:

  Anthracyclines

  Trastuzumab (*Herceptin Rx*)



Case 6.

- A 39-year-old woman presents with a firm 1 cm lump in right axillary tail. No palpable lymph nodes. She chooses to undergo bilateral mastectomy and reconstruction.

  Pathology Stage I, ductal carcinoma, clear margins; ER+, PR+, HER2 negative.

  Tamoxifen is recommended post-surgery.

Case 6.

In addition to reducing cancer recurrence, which is an important effect of tamoxifen to include in discussion of risks-benefits?

A. Decreased risk of uterine cancer
B. Increased risk of ovarian cancer
C. Increased risk of coronary artery disease
D. Increased risk of depression
E. Increased risk of thromboembolic disease

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Adjuvant Therapy – Definition

Systemic therapy administered after treatment of the primary tumor with the intention to eradicate micrometastatic disease

Adjuvant Hormonal Therapy

- ER+ and/or PR+ cancers only
- **Tamoxifen** (pre- or postmenopausal) Selective estrogen receptor modulator (SERM), reduces risk of recurrence by 50% and improves survival out to 15 years post diagnosis.
  - Duration 10 years (or 5 yrs + AI x 5 yrs)
    - Data benefit to 10 years in ER+ trials
      - (Davies et al, *Lancet* 2013; 381:805-16.
      - 12,894 women randomized to 10 yrs vs 5yrs, benefit recurrence and mortality, average follow-up 12.6 yrs)
    - Revised practice guideline 2014 ASCO (Am Soc Clin Oncology)

Adjuvant Hormonal Therapy - 2

- **Aromatase inhibitors** (postmenopausal) slightly more effective than tamoxifen (ie Anastrazole, Letrazole).
  - Benefit after 2-3 or 5 years; also show additional benefit over 5 years of tamoxifen alone

Current guidelines Am Soc Clinical Oncology:

Adjuvant Rx with tamoxifen premenopausal ER+ tumor
Adjuvant Rx Aromatase Inhibitors post-menopausal ER+ (if not able to tolerate AI or osteopenia/osteoporosis→Tamoxifen Rx)

- **LHRH** agonists sometimes used when ovarian suppression desired (ie Goserelin)

Adjuvant Hormonal Therapy - 3

Tamoxifen side effects

- (rare) uterine cancer, thromboembolic disease, cataracts
- (common) hot flashes, vaginal discharge, irregular menses
- favorable effect on lipids, bone density
- annual pelvic and eye exam; other w/u for sxs only

Aromatase inhibitor side effects

- (common) hot flashes, arthralgias, bone density loss, urogenital atrophy, mild hair thinning
- consider annual DEXA scanning

Adjuvant Chemotherapy

- indicated for node positive disease
- indicated for high risk node negative disease
- many reasonable regimens
- Oncotype Dx:
  - gene array that predicts chemotherapy benefit and provides prognostic information (node -, ER+)
- Adjuvant Online--predictive/prognostic modeling tool

Case 7.

- 49 y/o healthy, premenopausal woman has a 1.5 cm invasive breast cancer. The lesion is completely excised with clear margins. Axillary node sampling shows 2 + LNs. The tumor is ER-,PR-,HER2/neu 3+. She has a family history of postmenopausal breast cancer in her mother.

Case 7.
Which of the following is the best treatment option?

A. Modified radical mastectomy, followed by tamoxifen and chemotherapy + trastuzumab
B. Chemotherapy, but no further treatment to the breast
C. Chemotherapy + trastuzumab, tamoxifen and radiation therapy to the breast and axillary region.
D. Chemotherapy + trastuzumab and radiation therapy to the breast and axillary regions

Case 7.

- Chemotherapy, trastuzumab and radiation.

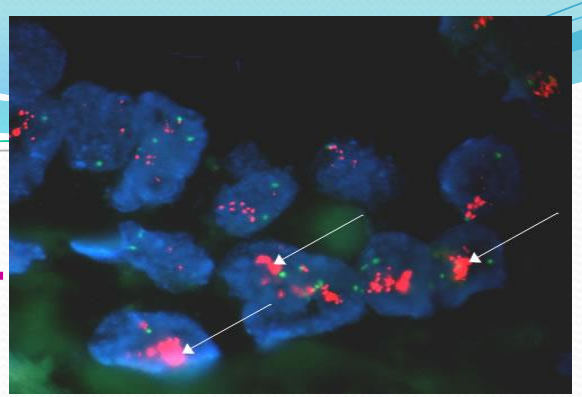
- Mastectomy not required with adequate margins.
  Tamoxifen not helpful with ER/PR neg disease.
  Trastuzumab indicated in HER2-positive disease.

  XRT controversial, but often recommended in 1-3 node group.

Adjuvant Chemotherapy

- indicated for node positive disease
- indicated for high risk node negative disease
- many reasonable regimens
- Oncotype Dx: gene array that predicts chemotherapy benefit and provides prognostic information (node -, ER+)
- Adjuvant Online--predictive/prognostic modeling tool

HER2 expression



- Adjuvant **trastuzumab** *(Herceptin)* improves survival and decreases recurrence in patients with highly positive HER2 (node + or high risk node -)
  - biggest breakthrough since tamoxifen

Other approved agents for HER2+ as neoadjuvant Rx:

- Pertuzumab (dual HER2 Rx, in combination with trastuzumab and chemo
- Neratinib, a tyrosine-kinase inhibitor, FDA approved for early stage HER2+ after ≥1 yr post-surgery trastuzumab (modest benefit; GI side effects common)

Sentinel Lymph Nodes

- blue dye +/- radioactive colloid injected and draining sentinel nodes are removed
- if negative, no further nodes removed
- if positive, further level 1 and 2 axillary LN dissection (ALND) performed
  - postmastectomy XRT indicated if ≥4 + LNs
  - postmastectomy radiation considered if 1-3 positive LNs (survival benefit some studies)

- Ongoing questions about value of LND in breast cancer

Case 8

- A 37-year-old woman with an early stage breast cancer s/p bilateral mastectomy and reconstruction, has been on tamoxifen for 1 year.

  She has military PTSD (post traumatic stress disorder) and 1 month ago had a severe trauma at work, persistent low mood despite counseling and she wishes to begin an anti-depressant. Her mood is affecting her ability to work. No suicidal ideation.

Case 8.

Which is the best treatment for her depression?

A. Fluoxetine
B. Venlafaxine
C. Bupropion
D. Paroxetine
E. No antidepressant is recommended

Case 8

- Several commonly used medications are metabolized through the CYP2D6 pathway and may be potent inhibitors of tamoxifen metabolism

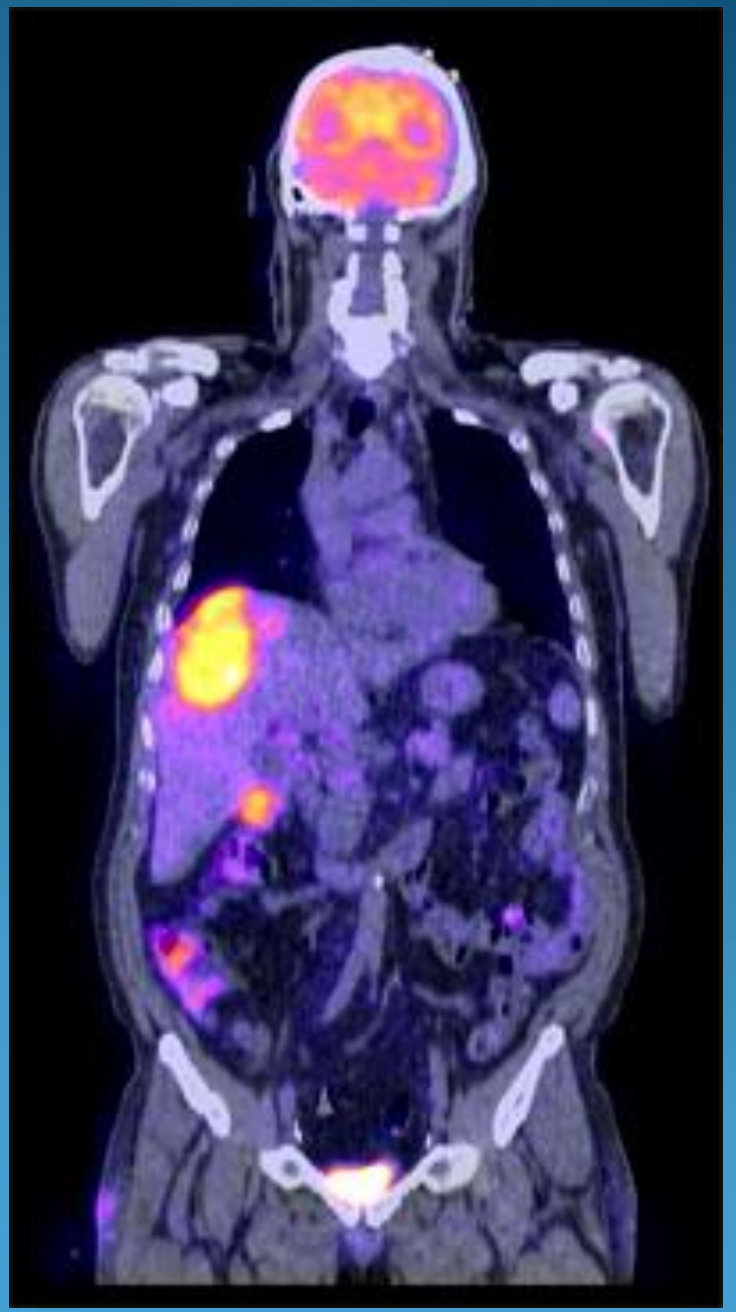
Antidepressants in Patients on Hormonal Therapy

- CYP2DP Potent inhibitors that may lower endoxifen levels (best avoid if alternative):
  - paroxetine
  - fluoxetine
  - buproprion
- Weaker inhibition (preferred):
  - venlafaxine, desvenlafaxine
  - citalopram
  - escitalopram

Metastatic Breast Cancer

- Usually not curable
- Overall survival is improving, >5 yrs possible
- Many different treatments such as:
  - hormonal agents
  - chemotherapies
  - targeted therapies, ie
    - CDK4-6 inhibitors (Abemacimab (*Verzenio*), Balbociclab (*Ibrance*)
      - for HR+, HER2 neg
      - Rx with AI in post-menopausal women and in men
      - Rx with Fulvestrant in pre-menopausal women progressing after hormonal Rx
      - Reduce dose in pts on CYP3A inhibitor
  - Combinations

PET/CT Fusion Imaging



Back pain and cancer

Spinal cord compression must be ruled out (MRI) in a patient with cancer who presents with localized back pain. Plain film are insufficient, though might detect compression fractures. Bone scans are helpful in assessing disease extent everywhere, but do not show the anatomy around the cord.

- IV dexamethasone if neurologic findings.
- Neurosurgery referral

Case 9.

- A 42 yr old woman presents with a 8 week history of a rapidly progressive warm, red breast. She is G2P2 and her youngest child is 12. She reports no trauma to the breast. Her physical exam shows the following:

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Case 9.

- Your examination reveals erythema, peau d'orange and warmth. You put her on a course of antibiotics, which make no difference after a week. You send her for a mammogram, which shows skin edema but no focal mass.
- You refer her to a surgeon who does a skin biopsy, which shows infiltrating ductal carcinoma in the dermal lymphatics. Staging workup is negative for distant metastases.

Case 9.

The next appropriate steps would be:

A. Chemotherapy followed by mastectomy and radiation
B. Modified radical mastectomy followed by chemotherapy
C. Modified radical mastectomy followed by chemotherapy and radiation
D. Hospice referral

Case 9.

- Diagnosis is Inflammatory breast cancer
- This is best treated with systemic treatment up front followed by local therapies. 5 yr DFS is historically very poor with surgery alone (<10%), but now may approach 50% with combined modality therapy.

Breast Cancer Prevention

- Several **models** are validated (online or handheld) that predict 5 year and lifetime risks of breast cancer
- USPSTF does not endorse one model.
- Age of menarche and current age
  - Family history
  - # prior biopsies and atypia
  - Race (AA increased mortality breast CA)
  - May underestimate risk with strong family hx

Case 10.

Which is true about prophylaxis/prevention of breast cancer?

A. There is a survival benefit
B. No survival benefit, but reduced risk of Hormone + breast Cancer by 25%
C. No survival benefit, but reduced risk of Hormone + breast cancer by 50%
D. No survival benefit, but reduced risk of Hormone + breast cancer by 75%
E. None of the above

Breast Cancer Prevention - 2

- Tamoxifen or raloxifene (SERMS) FDA approved; decrease the risk of developing HR + breast cancer by 50%. Context: If the 5-year risk of breast cancer is 3%, means reduction to 1.5% (as seen in P01 Prevention trial).
  - Nelson et al. *Ann Intern Med* 2013; 158:604-14. Review of Meds for Reducing Risk Primary Breast Cancer – for USPSTF
  - JAMA 2019 USPSTF updated, Grade B rec to review with high-risk pts
  - SERMS reduce risk invasive breast cancer by 7-9 cases/1000 x 5 yrs over placebo; Tamoxifen more effective (5 fewer cases) but 4 more VTE/1000 and more risk endometrial CA and cataract)
  - Raloxifene only in post-menopausal pts.
  - Others studied, but not FDA approved.

There is **no survival** benefit in this setting (breast cancer related or all-cause mortality).

Breast Cancer Prevention - 3

- ASCO recommends consider prophylaxis x 5 yrs in the following:
- Age of 35 years or older with a life expectancy of at least 10 years and one of the following:
  - •History of thoracic radiation administered prior to 30 years of age.
  - •A history of lobular carcinoma in situ.
  - •A ≥1.7 percent five-year risk for breast cancer (for example, as determined by modified Gail model).
  - •Atypical hyperplasia

- USPST 2013 →2019 updated guidelines *Ann Intern Med* 2013; *JAMA* 2019)
  - **Grade B Rec:** "***…that clinicians engage in shared decision making with women at increased risk for breast cancer about medications to reduce risk. For pts increased risk breast CA and low risk medication side effects, offer to prescribe risk-reducing medications such asTamoxifen or Raloxifene.***"

Breast Cancer IM board review

Thank you!

1 min Stretch break

(On your own later: more text slides on breast cancer screening, case answers last slide)

Staging

- **T: tumor size**
  - T1 <2cm
  - T2 2-5 cm
  - T3 >5 cm
  - T4 skin/chest wall/ulcerated/inflammatory
- **N: nodes**
  - N0 no nodes
  - N1 1-3 positive axillary nodes
  - N2 4-9 positive nodes or clinically matted nodes
  - N3 >10 positive nodes, +IM nodes, +supraclav LN

Staging - 2

- **In situ** (TisN0)
- **Stage I** (T1N0)
- **Stage II**
  - IIA T1N1, T2N0
  - IIB T2N1, T3N0
- **Stage III**
  - IIIA T1N2, T2N2, T3N1, T3N2
  - IIIB T4,N(any) –skin/chest wall/ inflammatory
  - III C T(any)N3
- **Stage IV** distant metastases

Breast Cancer Diagnosis Mammography

- Majority of breast cancers are associated with an abnormal mammogram
- Mammographic sensitivity declines significantly with increased breast density
- Digital films better for dense tissue

Mammography screening in Average Risk Women: Questions

- When should we start mammogram screening for breast cancer?
  - Age 40
  - Age 45
  - Age 50+
  - How often?
- When should we stop?

Mammography screening in Average Risk Women

- Annual screening for **average risk** women:
  - Begin at age 40 versus 50 (USPSTF) controversial 2009→consider begin age 50)

    Discuss risks/benefits to women in their 40s; begin at age 40 if they prefer, o/w begin age 50.

  - ACS change in recs 10/2015 (JAMA 2015; 314:1599-1614)

    Average risk:

    Annual screening age 45-54

    QOYr age 55-75, opportunity for annual if wish

    Opportunity to begin age 40 if pt wishes

    Continue as long as good health+ life exp 10+yrs

    - *Do not recommend clinical breast exam any age average risk for screening (do if lump or sx reported)*

Mammography screening in Average Risk Women

- Annual screening for **average risk** women:
  - $ Cost of screening raised (O'Donoghue, *Ann Intern Med* 2014, Editorial Elmore, 2014)
  - DCIS overdx?:
    - Editorial Kaplan *Ann Intern Med* 2013
      Oncologist perspective

      Uncertainty of outcome of DCIS, progression to invasive cancer 14-53% (depending on length of follow-up; Erbas *Breast Cancer Res Treat* 2006)

Mammography screening in Average Risk Women - NNS

- NN To Invite vs NN to Screen to prevent 1 breast CA related death:

USPSTF 2009 (NNI)	NNS*
age 40-49: 1904**	746
Age 50-59: 1339	351
Age 60-69: 377	233

*Hendrick, *AJR* 2012;198:723-28. The NNS based on CISNET modeling results is much smaller than the NNI based on RCT data. Eighty-four women need to be screened annually between 40 and 84 years to save one life from breast cancer.

**(breast CA most common cause of death in 40-49 age group in US)

Breast angiosarcoma

- Incidence of radiation-related angiosarcoma varies from 0.05-0.2%
- Average latency of 12.5 years after XRT
- Present as purplish nodules in breast

Lymphedema

- Lifetime risk may be 30-50% in patients with ALND (highest risk with ALND + axillary XRT)
- Risk much smaller with just sentinel node biopsy (approximately 5%)
- Predisposes limb to cellulitis
- Risk increases with advancing age and obesity
- Risk increases with # years since surgery
- **Early intervention is critical** to arresting progression.
- Rx PT, lymphatic massage, compression garments and careful avoidance of infection.

Lymphedema long term

- Stewart-Treves syndrome is a rare lymphangiosarcoma that may develop in patients with chronic (and often severe) arm edema from axillary node dissection +/- radiation. The incidence is 0.03% in one large population study.

Figura 1 - Notar mastectomia e linfedema no membro superior esquerdo ipsilateral, associado à lesão vinhosa no terço superior.

Breast Cancer: Answers to Cases

Case 1. C

Case 2. D

Case 3. B

Case 4. D

Case 5. A

Case 6. E

Case 7. D

Case 8. B

Case 9. A

Case 10. C