Cancer Screening

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Disclosures

- Harrison Jackson: No disclosures
- Sonya Wegman: No disclosures

Objectives/Agenda

- Review screening guidelines for the following cancers:
  - Colorectal Cancer
  - Prostate Cancer
  - Cervical Cancer
  - Breast Cancer
  - Ovarian Cancer
  - Lung Cancer

Our Approach

- Primary Care Physician Point of View
- Adult Screenings

Colon Cancer

Prostate Cancer

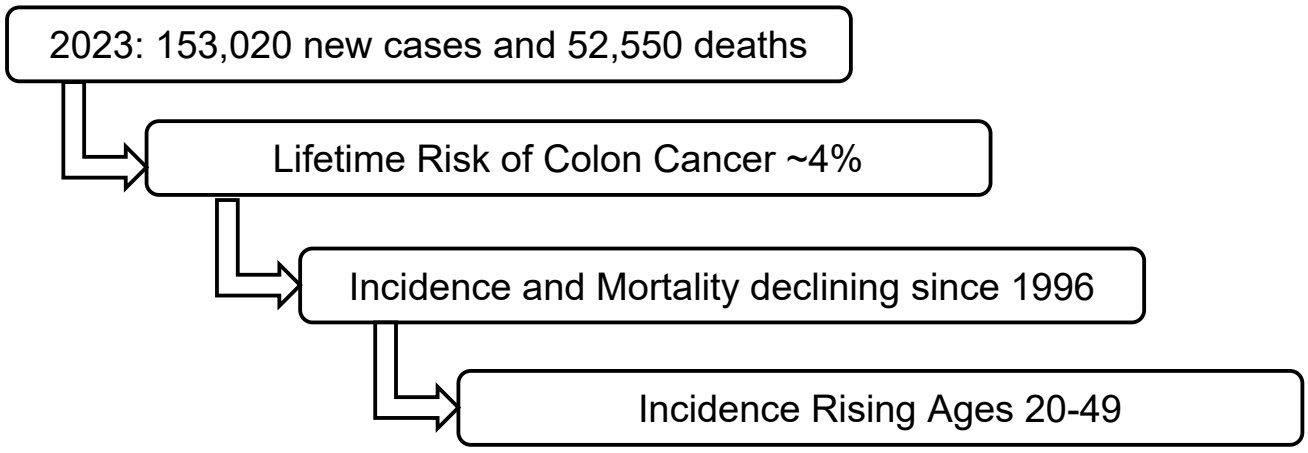
Breast Cancer

Professional Organizations

- AAFP: American Academy of Family Practitioners
- ACS: American Cancer Society
- ACOG: American College of Obstetricians and Gynecologists
- ACP: American College of Physicians
- AGA: American Gastroenterological Association
- ASCCP: American Society of Colposcopy and Cervical Pathology
- AUA: American Urologic Association
- NCCN: National Comprehensive Cancer Network
- USPSTF: United States Preventative Services Task Force
- USMSTF: United States Multi-Society Task Force on Colorectal Cancer

Colon Cancer Screening

Colon Cancer – Epidemiology



American Cancer Society 2023-2025

First Screening: What to Ask

- Patient's Age
- Personal history of colon polyps including pathology
- Family history of colon cancer with age of diagnosis
- Family history of advanced colon polyps with age of finding
  - Advanced Adenoma: high grade dysplasia, 1cm size, villous pathology
  - *Pro-tip: Ask how quickly the relative had to repeat the colonoscopy*

First Screening: Age to Start

	No personal or family history	1st Degree Relative with CRC or Adv Adenoma	2nd degree relatives only
Age 40 or 10 years before family diagnosis		X	
Age 45	X		X*

* If multiple cases on one side of family, consider genetic screening.

US Multi-Society Task force on Colorectal Cancer. *Gastroenterology* 2021

First Screening: Modalities

Modality	Frequency	CRC cases averted per 1000	CRC Deaths Averted
Colonoscopy	10 years	61	28
Stool FIT	1 year	50	28
Stool DNA	3 year	47	25
Stool FOBT	1 year	42	24
Flexible Sigmoidoscopy	5 years	51	24
CT Colonography	5 years	55	26

Screening for Colorectal Cancer. *JAMA* 2021

Blood Based Screening Tests

- For average risk patients
- Covered every 3 years
- Must order from vendor at this time

***Annals* October 2024**	**cf-bDNA every 3 years (Guardant Shield)**	**MT-sDNA every 3 years (Exact Sciences Cologuard)**	**FIT every Year**	**Colonoscopy every 10 years**
Relative Rate of CRC vs. No Screen	0.58	0.32	0.29	0.21
Relative Rate CRC Death vs. No Screen	0.44	0.27	0.25	0.19

Annals of Internal Medicine 17(12), October 2024

Colon Cancer Screening – Risks/Benefits

Benefits

Reduced Mortality
Reduced Incidence

Risks

Anxiety, Discomfort
0.05% chance perforation
0.18% chance serious bleeding

Do not let the ideal be the enemy of the good – any screening is better than none!

American Cancer Society, Colorectal Cancer Facts & Figures 2023-2025
JAMA May 17, 2021

Next Screening: Negative Non-Colonoscopy

Modality	Next Screening Timeline
Stool FOBT	1 year
Stool FIT	1 year
Stool DNA	3 years
Blood DNA	3 years
Flexible Sigmoidoscopy	5 years
CT Colonography	5 years

Next Screening: Positive Non-Colonoscopy

Any positive non-colonoscopy screening should have a diagnostic colonoscopy within six months

Test	Colorectal Cancer	Advanced Neoplasia	Non-Advanced Neoplasia	No Colorectal Neoplasia
FIT	2.3%	24.1%	39.5%	33.9%
sDNA	1%	27%	39%	33%

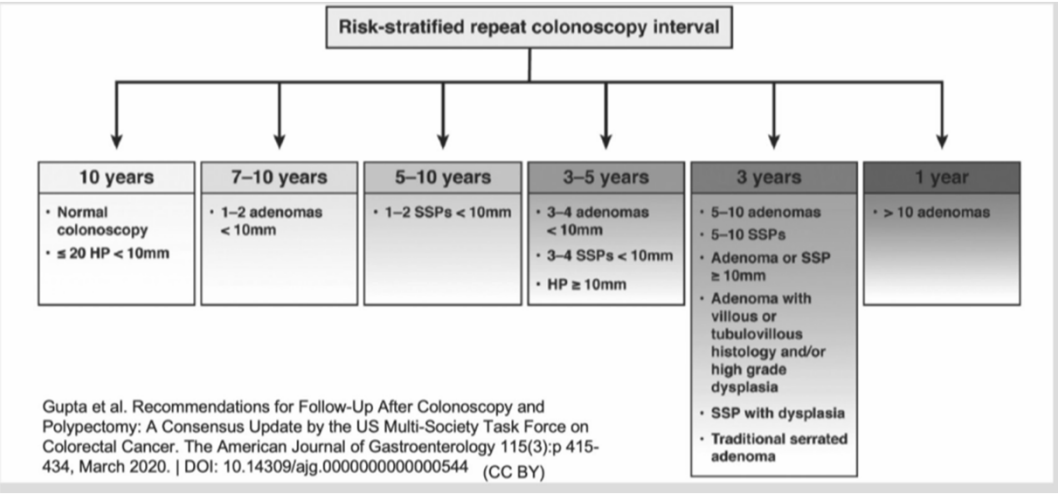
Lancet Oncology vol 25, 3 March 2024
Am J Gastroenterology vol 115, 4 April 2020

Next Screening: Negative Colonoscopy

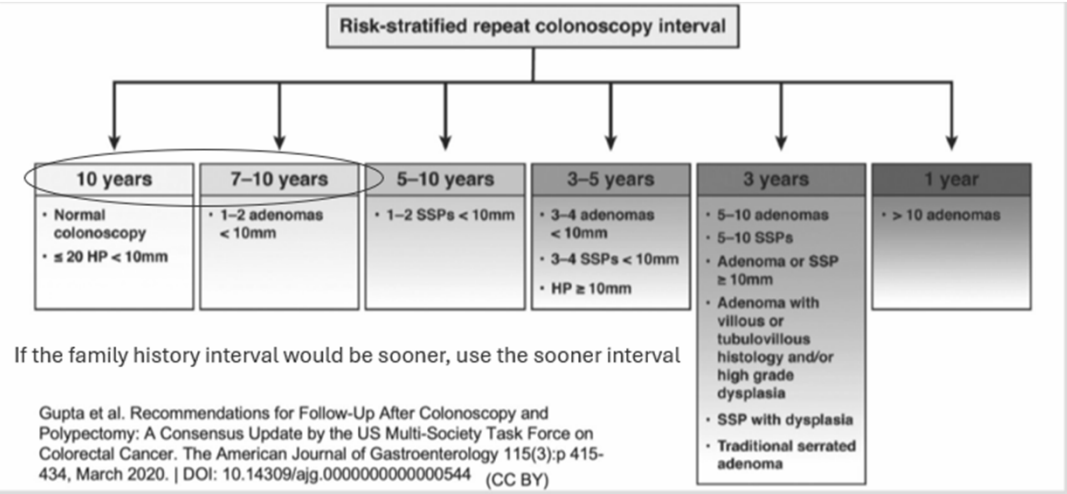
	One Year	Five Years	Ten Years
Good Prep, No Family History			X
Poor Prep (0 or 1 BPPS and section)	X		
One First Degree Dx < age 60		X	
Two First Degree Dx ≥ age 60		X	
One First Degree Dx ≥ age 60			X

American Journal Gastroenterology 2014

Next Screening: Positive Colonoscopy



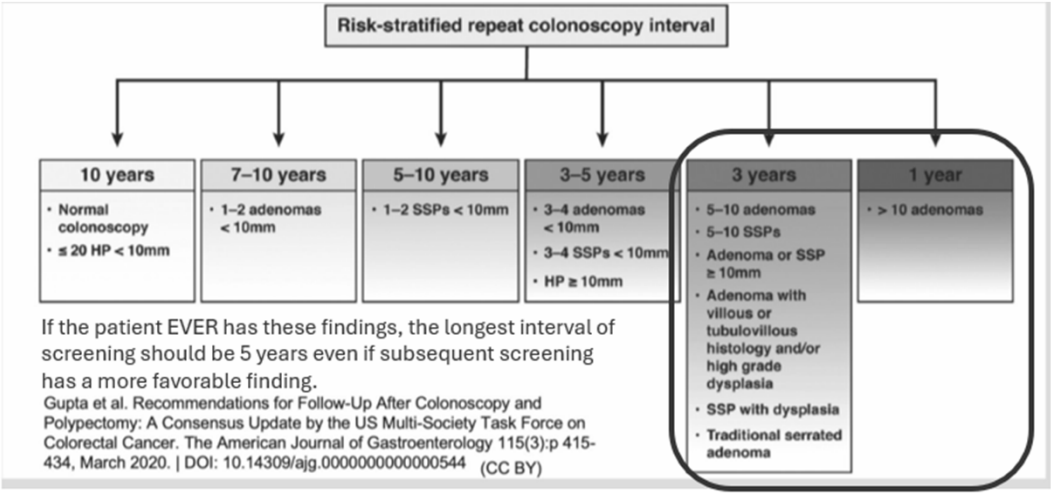
Next Screening: Positive Colonoscopy



If the family history interval would be sooner, use the sooner interval

Gupta et al. Recommendations for Follow-Up After Colonoscopy and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer. The American Journal of Gastroenterology 115(3):p 415-434, March 2020. | DOI: 10.14309/ajg.0000000000000544 (CC BY)

Next Screening: Positive Colonoscopy



If the patient EVER has these findings, the longest interval of screening should be 5 years even if subsequent screening has a more favorable finding.

Gupta et al. Recommendations for Follow-Up After Colonoscopy and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer. The American Journal of Gastroenterology 115(3):p 415-434, March 2020. | DOI: 10.14309/ajg.0000000000000544 (CC BY)

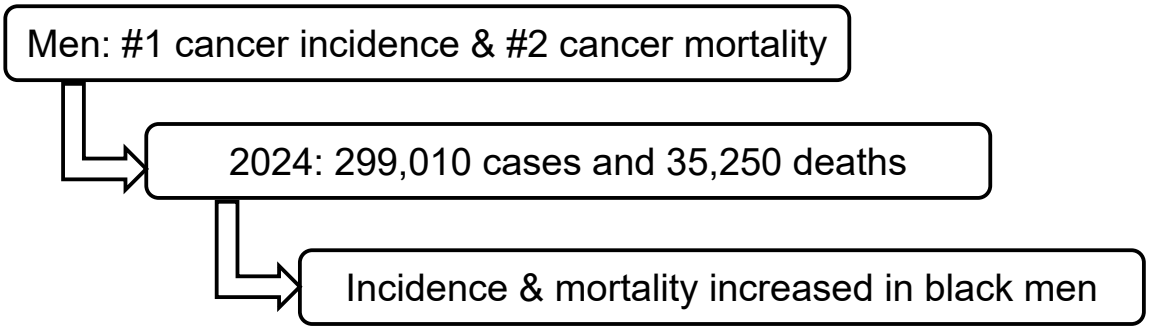
Last Screening

- Age 75: last routine screening
- Age 76-84: individualized discussion
- Age 85: end screening

USPSTF *Guidelines JAMA* 2021
USMSTF *Gastroenterology* 2022
American Cancer Society Guidelines 2023
NCCN Colorectal Cancer Screening Guidelines 2025

Prostate Cancer Screening

Prostate Cancer – Epidemiology



JAMA March 10, 2025, *NEJM* April 2023

First Screening

Organization	Intervention	Age to Start	Screening Interval
US Preventative Services Task Force	Shared Decision-Making regarding PSA Screening	55-69 yo	Not Specified
National Comprehensive Cancer Network	Shared Decision-Making regarding PSA Screening	Average Risk: 45-75 yo High risk: 40 -75 yo	PSA <1 = Q2-4 years PSA >1= Q1-2 years
American Urological Association	Shared Decision-Making regarding PSA Screening	Average Risk: 45-75 yo High risk: 40 -75 yo	Q2-4 years
American Academy of Family Physicians	Shared Decision-Making regarding PSA Screening	55-69 yo	Q2 years
American Cancer Society	Shared Decision-Making regarding PSA Screening	Average Risk: age 50 High risk: age 45	PSA <2.5 = Q2 years PSA >2.5= Q1 years

Adapted from N Engl J Med April 12, 2023

First ~~Screening~~ Shared Decision Making

Organization	Intervention	Age to Start	Screening Interval
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Adapted from N Engl J Med April 12, 2023

Modality: PSA not DRE

ChatGPT generated images

PSA Screening – Brief History

- 1994: FDA approves PSA for cancer screening
- 2002: USPSTF Grade I : Insufficient Evidence
- 2008: USPSTF Grade D: Recommend Against
- 2018: USPSTF Grade C: Shared Decision Making

Annal August Aug 5 2008, NEJM March 26 2009, J Natl Cancer Jan 18 2012, NEJM April 12, 2023, *CA Cancer J Clin* 2023

Prostate Cancer Screening – Risks/Benefits

Benefits

Reduced Mortality: between 1.3 and 9.9 per 1000 screened

Reassurance: age 55-59 and PSA <1, cumulative risk of prostate cancer 0.3% over 15 years

Risks

Over Diagnosis: 2-4% over 11 years

Biopsy: 1-3% risk of hospitalization for bleeding/infection

Overtreatment: 83% will receive treatment, complications of ED, incontinence, bowel dysfunction

NEJM April 12, 2023, *European Urology* March 2019, NCCN 2025

MRI

- As part of screening workup
  - Increases detection of high-risk cancer
  - Cannot exclude prostate cancer
  - May increase biopsy rate of insignificant cancers
- As part of biopsy
  - Improves detection of clinically significant cancer
  - Lowers detection of clinically insignificant cancer

NEJM April 12, 2023, NCCN 2025

Screening: Initiation and Intervals

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Adapted from N Engl J Med April 12, 2023

Screening: Initiation and Intervals

- High Risk: Black male, prostate cancer in father, known germline mutation
- Referral Threshold
  - PSA > 2 in 40s
  - PSA > 3 in 50s and 60s
  - PSA > 4 in 70s
- Baseline PSA
- Other considerations
  - Reliability of patient
  - Standardization of workflow
  - Reassurance

Baseline PSA

- PSA median in 40s = 0.7 ng/dl
- PSA >1.7 = 8.7 odds ratio of lethal cancer

- Black men ages 40-54
  - PSA > 0.72 = 25.2 odds ratio of prostate cancer
    - 49.6 odds ratio aggressive prostate cancer
  - PSA > 1.68-1.85 = 83.6 odds ratio of prostate cancer
    - 174 odds ratio of aggressive prostate cancer

CA Cancer Journal 2025, *JCO* 2016, *Eur Erol* 2019

Last Screening

- Most patients between age 70 and 75
  - 76-84 in patients with almost no comorbidities
- PSA < 3 in 70s have little chance of future metastatic prostate cancer

NCCN 2025

Cancer Screening

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Cervical Cancer Screening

Cervical Cancer – Epidemiology

13,000 new cases/year in US → 4300 deaths/year in US

1 in 4 patients in the US not UTD with screening

About half of cases occur in underscreening patients

A single lifetime screen with HPV testing may reduce risk and mortality by 50%

CDC Cervical Cancer Statistics 2025
NIH Cancer Trends Progress Report 2025
Journal of Lower Genital Tract Disease, Apr 2011
NEJM, Apr 2, 2009

Cervical Cancer Screening – Risks/Benefits

Benefits	Risks
Reduced rates of cervical cancer	Patient discomfort/anxiety
Reduced mortality, higher cure rates	False positives
	Overdiagnosis - additional testing/procedures

Lancet 1987
NIH Surveillance, Epidemiology and End Results Program
Systematic Reviews, May 24, 2013. PMID: 23706117

Cervical Cancer Screening - Modalities

- Cervical Cytology (Pap smear)
- Primary HPV testing
  - Provider performed cervical swab
    - Option for reflex to cytology
  - Self-collected vaginal swab
- Co-testing (HPV + Cervical cytology)

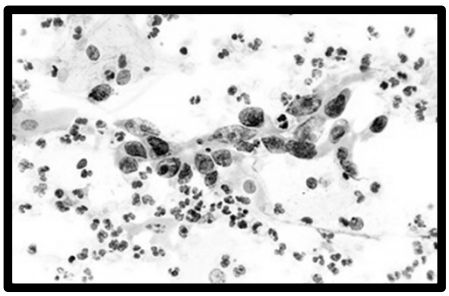


Image from: National Cancer Institute, March 1993 Image ID 2578

Cervical Cancer Screening - Guidelines

USPSTF	ACOG	ACS
21-29yo: Cytology Q3Y ≥30yo: Primary HPV Q5Y Alternatives: Cotesting Q5Y, Cytology Q3Y	21-29yo: Cytology Q3Y ≥30yo: Cytology Q3Y, Primary HPV Q5Y, cotesting Q5Y	≥25yo: Primary HPV Q5Y Alternatives: Cotesting Q5Y, Cytology alone Q3Y

USPSTF Draft Update, Dec 2024
ACOG, Apr 2025
ACS, Jul 2025

Cervical Cancer Screening – Differences in Guidelines

- Type of testing: changing landscape
  - Availability/accuracy of HPV testing
- Age of initiation:
  - Low cancer rates in early 20s
    - Uptake of HPV vaccine
  - Concerns about worsening already low screening rates if delaying until age 25yo

Cervical Cancer Screening – Result Management

- Timing and type of subsequent testing depends on both current and prior results, risk of CIN
- Use of ASCCP Webtool can help to guide decisions

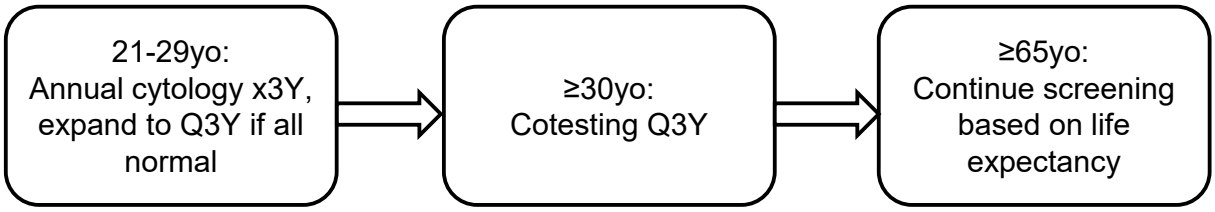
Cervical Cancer Screening – Discontinuation

- Age ≥65
  - No history of CIN2 or greater for past 25 years
  - Adequate screening prior to discontinuation:
    - Two negative HPV/cotests in past 10 years (most recent in last 5 years)

    OR
    - Three negative Paps in last 10 years with (most recent in last 3 years)
- Life expectancy <10 years
- S/p total hysterectomy with no history of CIN or cervical cancer

Cervical Cancer Screening – High Risk

- Immunocompromised
  - Includes: HIV/AIDs, Transplant, biologic therapy

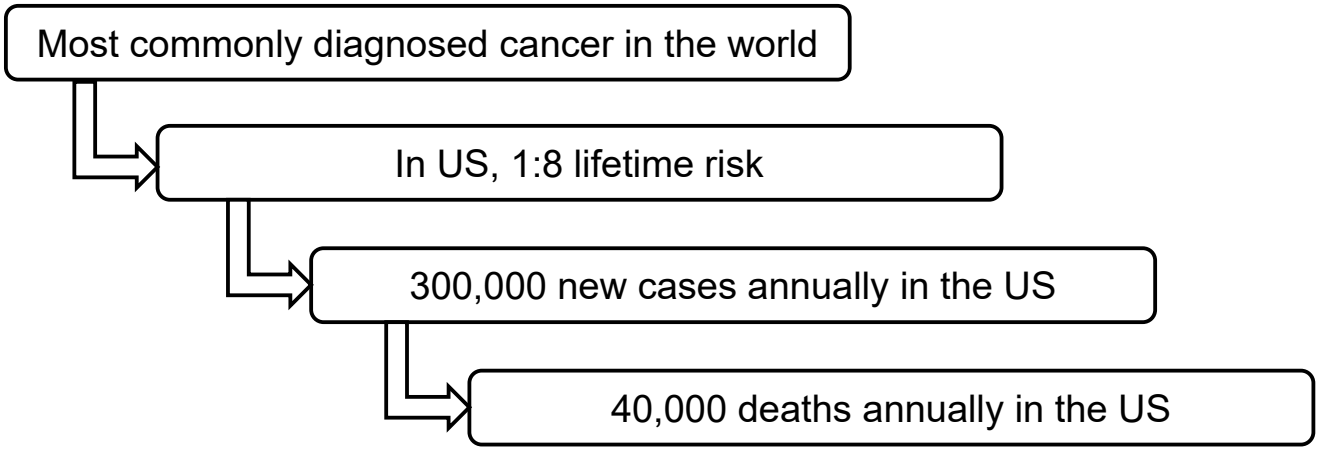


- Exposure to DES in utero
  - Increased risk of vaginal and cervical cancer → Annual exam for life

ClinicalInfo.HIV.gov, Jul 2024

Breast Cancer Screening

Breast Cancer – Epidemiology



ACS, Cancer Statistics, 2023

Breast Cancer Screening – Guidelines

	USPSTF	ACOG	ACS	NCCN
Mammogram Initiation and Frequency	≥40yo: biennial	≥40yo: annual or biennial	40-44: optional annual 45-54: annual ≥55: annual or biennial	≥40yo: annual
Discontinuing screening	Age 75yo	Shared decision making after 75yo	Life expectancy <10yr	Life expectancy <10yr

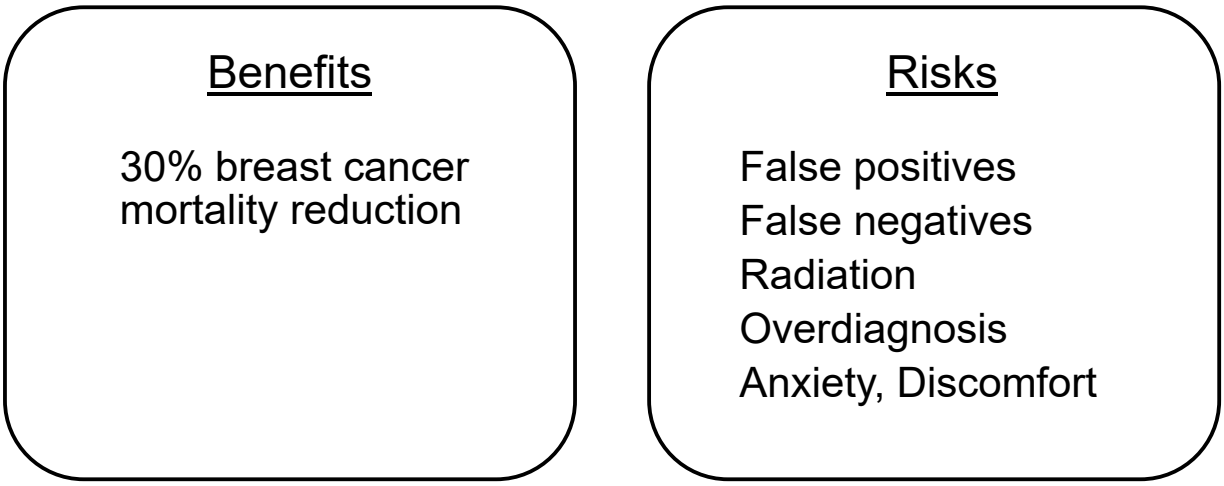
USPSTF, JAMA, Jun 11, 2024
ACOG, Oct 10, 2024
ACS, Dec 19, 2023
NCCN, Feb 2025

Breast Cancer Screening – Differences in Guidelines

- Annual vs Biennial Screening
  - Small reduction in deaths, increase in life-years gained
  - Large increase in false positives, unnecessary biopsies/imaging, overdiagnosis
  - USPSTF: Biennial screening has favorable balance of benefits to harms

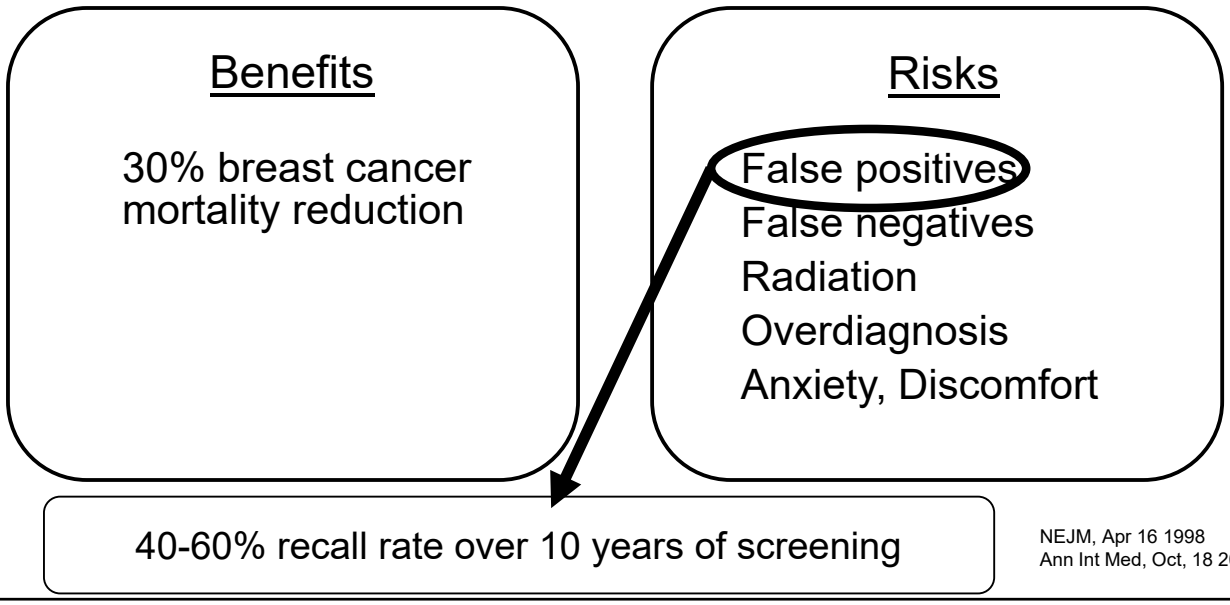
JAMA Oncology, Nov 2015
USPSTF, JAMA, Jun 11, 2024

Breast Cancer Screening – Risks/Benefits



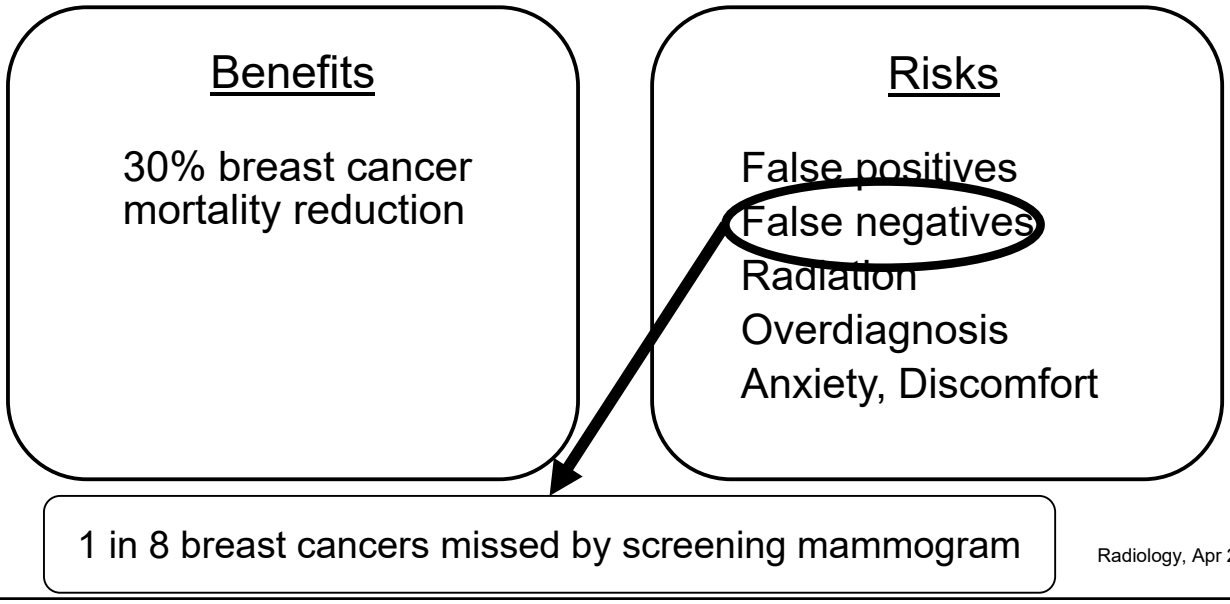
JAMA, Jun 11, 2024

Breast Cancer Screening – Risks/Benefits



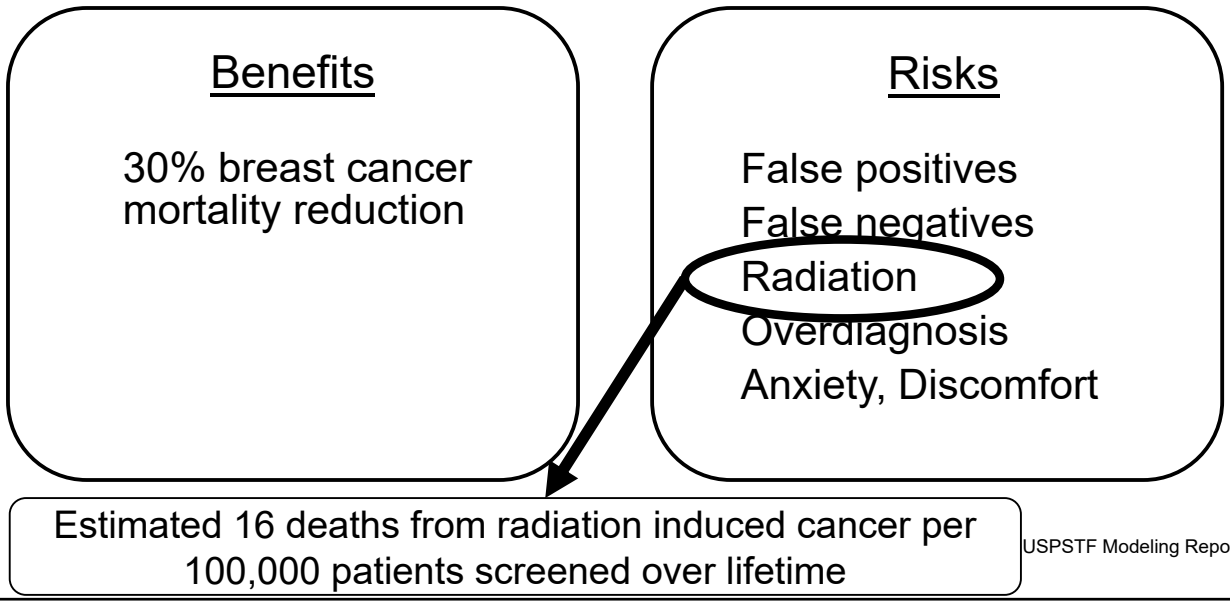
NEJM, Apr 16 1998
Ann Int Med, Oct, 18 2011

Breast Cancer Screening – Risks/Benefits



Radiology, Apr 2017

Breast Cancer Screening – Risks/Benefits



USPSTF Modeling Report, 2015

Breast Cancer Screening – Additional Screening Modalities

- Clinical Breast Exam
  - May have small increase in cancer detection without change in outcomes
  - High false positive rate

USPSTF	ACS	ACOG	NCCN
Does not recommend for or against CBE – insufficient evidence	Does not recommend CBE "Breast self-awareness"	Age 25-39yo: offer every 1-3 years Age >40: offer annual CBE	25-40yo: Q1-3Y >40yo: annual

USPSTF, Ann In Med, 2009

Breast Cancer Screening – Additional Screening Modalities

- Whole Breast Ultrasound
  - Handheld/manual vs automated
  - Small increase in sensitivity, large increase in false positives
  - Adjunct in patients with dense breast tissue?
    - USPSTF: not enough evidence to recommend
    - No guidelines from ACOG, ACS
  - May not be covered by insurance

JAMA Intern Med, 2019

Breast Cancer Screening – Additional Screening Modalities

- MRI
  - Most sensitive test available
  - Limited by cost, contrast exposure
  - Used in conjunction with mammogram
  - Recommended for use in high-risk populations:
    - Calculated lifetime risk >20%
      - BRCA1/2
      - Strong family history of breast/ovarian cancer
      - History of radiation to chest (Hodgkin lymphoma)

Breast Cancer Risk Assessment

- Various models:
  - The National Cancer Institute Breast Cancer Risk Assessment Tool (Gail Model)
  - The Breast Cancer Surveillance Consortium's Risk Calculator
  - Tyrer-Cuzick
- Accounts for additional risk factors – personal/family history, ancestry, breast density, parity, age of menarche, first live birth, etc.
- 20% is generally used as cut off for "high risk"

Ovarian Cancer Screening

Ovarian Cancer Screening

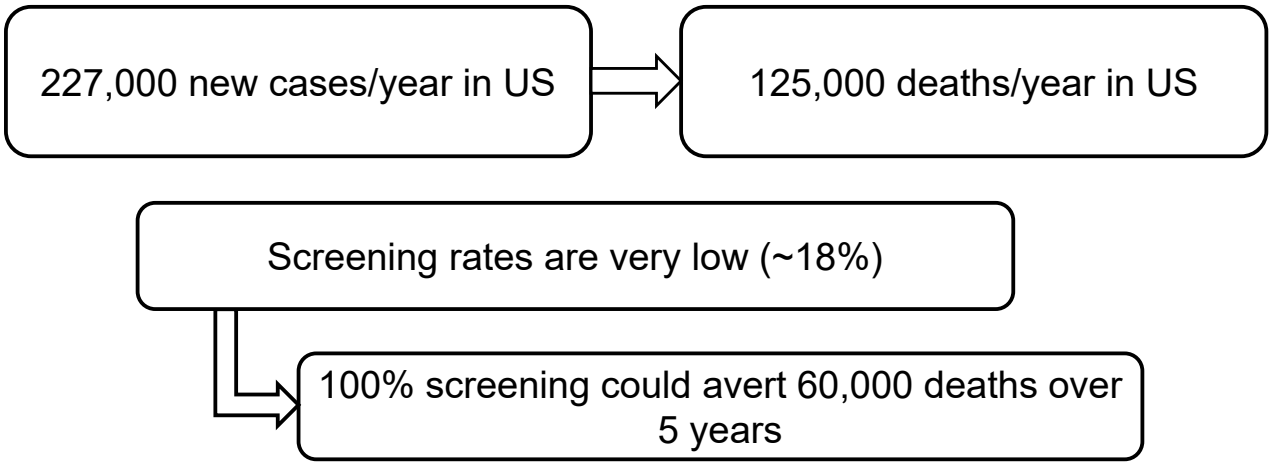
- No recommendations to screen average risk patients
- Refer patients with high-risk family history to genetic counselor
- Can be considered in high-risk patients (BRCA1/2, Lynch syndrome)
  - TVUS, CA125 Q6 months

Genetic Testing – Breast/Ovarian Cancer Risk

- Personal history of breast cancer <50yo or ovarian cancer
- Breast cancer at any age if:
  - ✓ Male
  - ✓ Ashkenazi Jewish ethnicity
  - ✓ Triple negative
  - ✓ Multiple primary breast cancers
  - ✓ Multiple family members with ovarian, breast, prostate, or pancreatic cancers
- Family history of any of the above

Lung Cancer Screening

Lung Cancer – Epidemiology



ACS, Cancer Statistics, 2025
JAMA, Nov 19, 2025

Lung Cancer Screening - NLST

- National Lung Screening Trial (NLST) (2011)
  - Compared LDCT to CXR
    - Number needed to screen (to prevent 1 death): 320
    - 20% relative reduction in mortality from lung cancer
    - 6.7% reduction in all-cause mortality

NEJM, Aug 4, 2011

Lung Cancer Screening - USPSTF Guidelines

Patient selection	Modality	Frequency
50-80yo* ≥20 pack year smoker Current smoker or Quit in last 15 years	Low-dose chest CT	Annual

*Medicare only covers up to age 77yo

USPSTF, Mar 9, 2021

Lung Cancer Screening – Risks/Benefits

<u>Benefits</u>

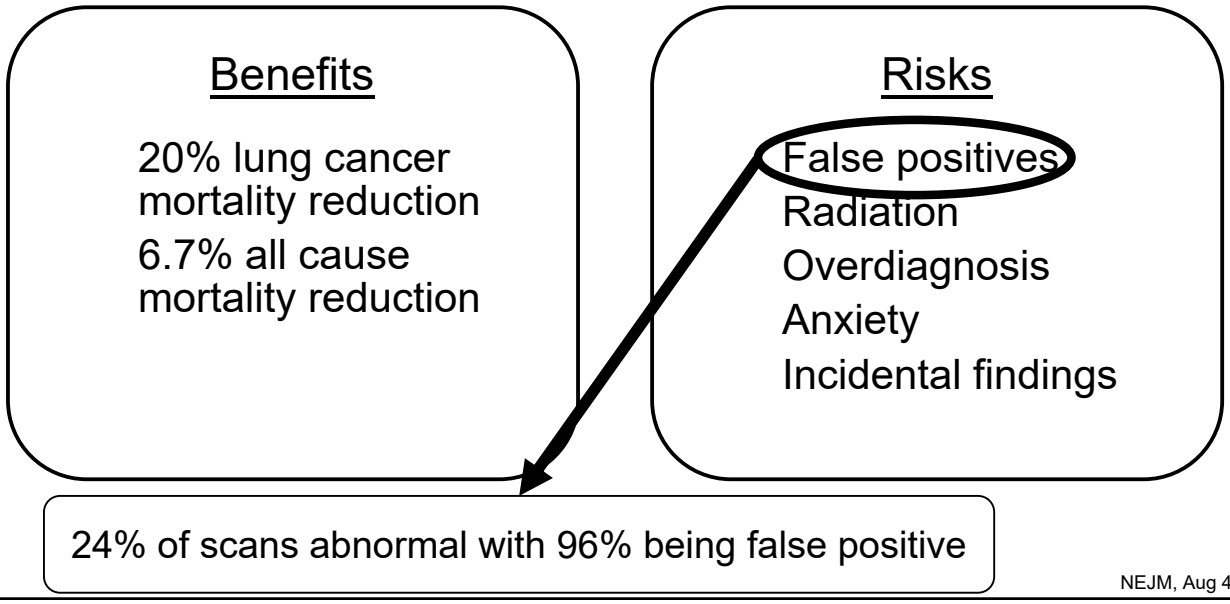
20% lung cancer mortality reduction

6.7% all cause mortality reduction

<u>Risks</u>

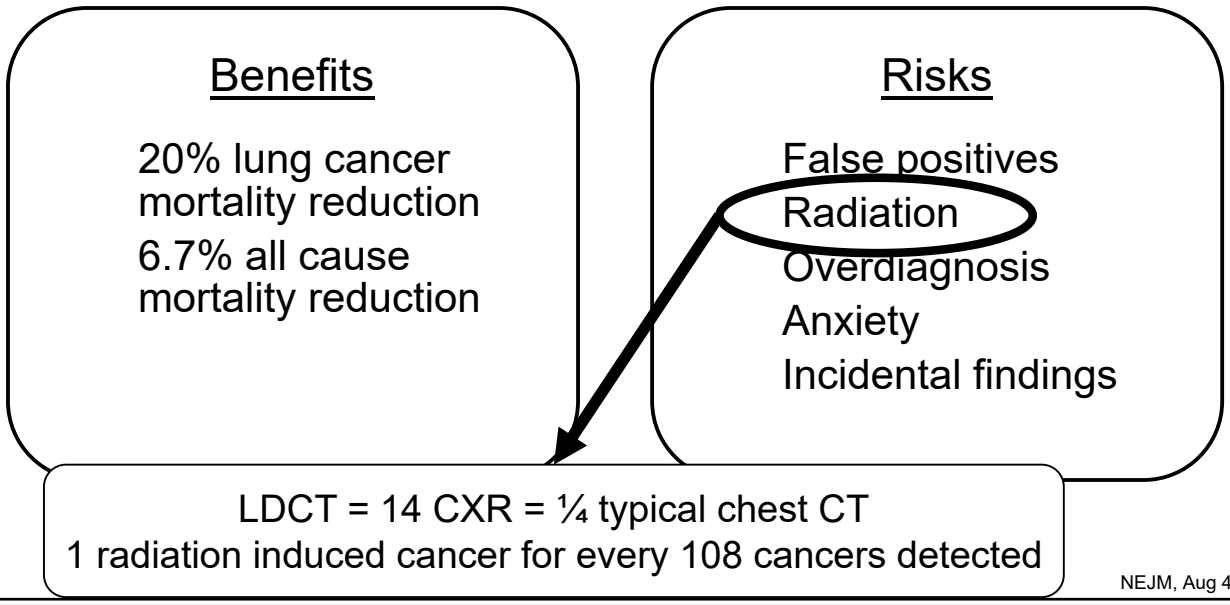
False positives
Radiation
Overdiagnosis
Anxiety
Incidental findings

Lung Cancer Screening – Risks/Benefits



NEJM, Aug 4, 2011

Lung Cancer Screening – Risks/Benefits



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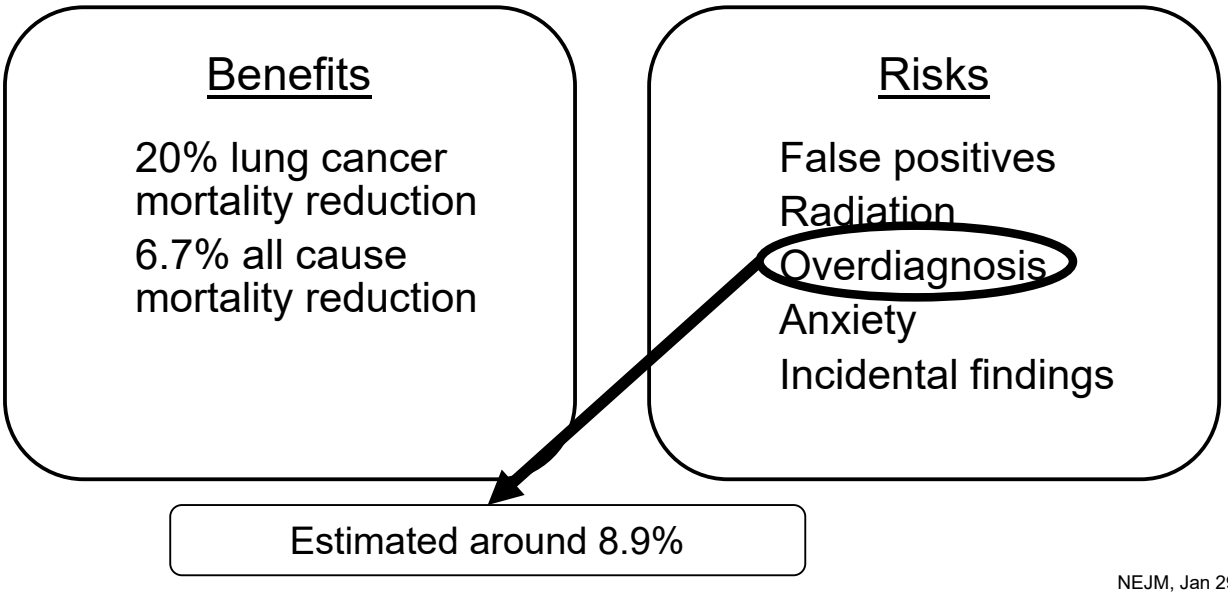
Lung Cancer Screening – Risks/Benefits



NEJM, Jan 29, 2020

Lung Cancer Screening – Counseling Points

- Smoking cessation!!
- Follow-up studies are needed for adequate screening
  - Annual testing
  - Additional testing for abnormalities found – follow-up imaging, potential for biopsy
- High likelihood of false positives leading to further investigations

Lung Cancer Screening – Discontinuation

- Age >80yo
- No smoking in last 15 years
- Limited life expectancy

USPSTF, Mar 9, 2021