Lung Cancer Screening and Health Disparities

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Learning Objectives

After completing this activity, the participant should be better able to:

1. Identify the socioeconomic factors and underserved populations associated with lung cancer screening.

2. Recognize opportunities to educate patients and the public on the lung cancer screening options.

Physician Accreditation Statement

- The American College of Radiology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Physician Credit Designation

- The American College of Radiology designates this live activity for a maximum of 1.0 *AMA PRA Category 1 Credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Instructions to Receive Credit

- In order to successfully complete the activity, participants must complete an activity evaluation and claim credit commensurate with their participation in the activity.

Contact Information

For information about the accreditation of this program, please contact the ACR at info@acr.org

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Andrea Borondy-Kitts, MS, MPH – Speakers' Bureau: Medtronic; COO & Investor: Prosumer Health, Associate Editor JACR

Agenda

Background

- Burden of Disease
- Smoking rates – socioeconomic factors
- Lung cancer incidence and mortality
- Evidence for LDCT Screening
- Lung cancer screening rates

Challenges for Patients

- Access to care
- LCS selection criteria
- Stigma, implicit bias, & nihilism
- Shared decision making
- Perceived risk of lung cancer

Path Forward

- Outreach programs and lung cancer screening in underserved communities
- NCCN guidelines including risk prediction model to select individuals at high risk
- Education to address stigma, clinician implicit bias and nihilism

Take-Home Points

Appendix – Resources

Lung Cancer is the Leading Cause of Cancer Deaths More than Next 3 Cancers Combined
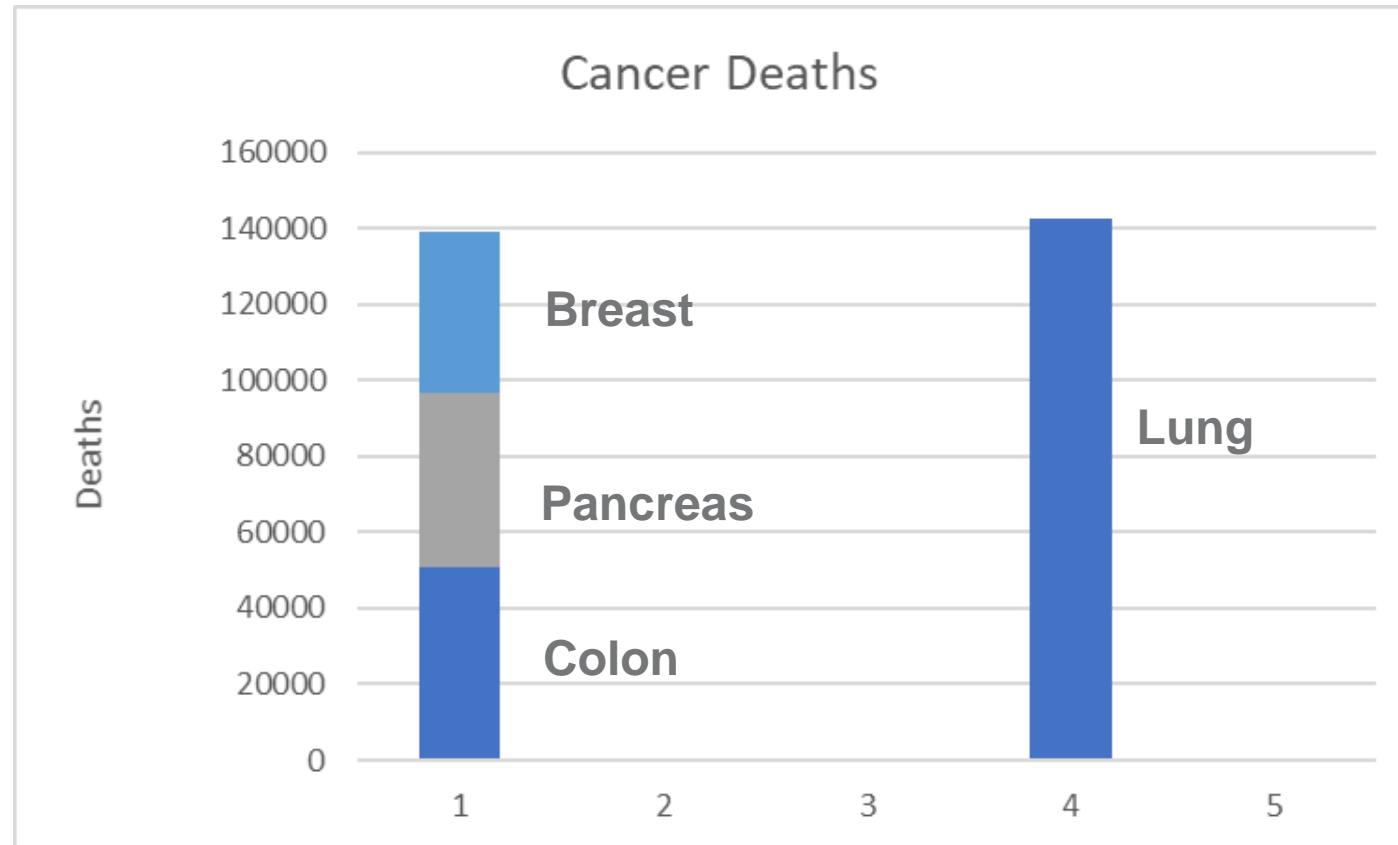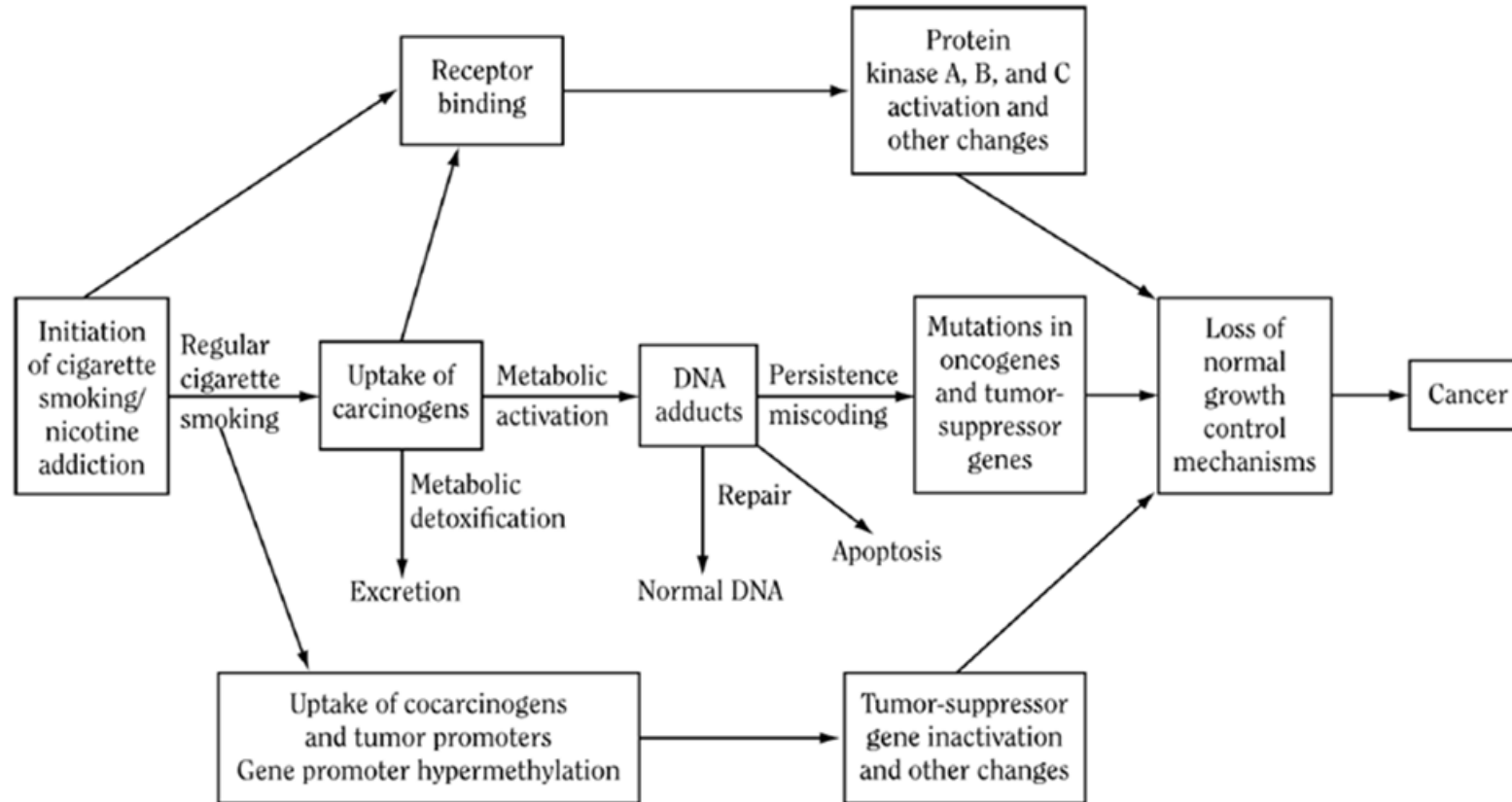
Lost Earnings Due to Lung Cancer $21.3 Billion in 2015
>2x the loss from next costliest cancer

Economic cost of cancer, by type	
Cancer type	**Cost**
Lung	$21.3 billion
Colorectal	$9.4 billion
Female breast	$6.2 billion
Pancreatic	$6.1 billion

Over 80% of Lung Cancers are caused by Tobacco

Figure 6.4 Pathway for causation of cancer by carcinogens in tobacco smoke

Source: Modified from U.S. Department of Health and Human Services 2010.

Native Americans & Alaska Natives Heaviest Smokers; Hispanics and Asians Lightest Smokers, Africans Americans & Whites Similar Smoking Rates

TABLE. Characteristics of current adult cigarette smokers* — National Health Interview Survey, United States, 2016

Characteristic	Males (n = 14,991)		Females (n = 18,037)		Total (n = 33,028)	
	Weighted % (95% CI)	Population estimate[†]	Weighted % (95% CI)	Population estimate	Weighted % (95% CI)	Population estimate
Overall	17.5 (16.6–18.5)	20,660,000	13.5 (12.8–14.3)	17,110,000	15.5 (14.8–16.1)	37,770,000
Race/Ethnicity[§]						
White	17.8 (16.8–18.8)	13,570,000	15.5 (14.6–16.5)	12,530,000	16.6 (15.9–17.4)	26,100,000
Black	20.2 (17.2–23.2)	2,600,000	13.5 (11.5–15.5)	2,130,000	16.5 (14.7–18.3)	4,730,000
Hispanic	14.5 (11.8–17.2)	2,780,000	7.0 (5.6–8.3)	1,350,000	10.7 (9.2–12.3)	4,140,000
AI/AN	29.3 (19.3–39.4)	230,000	34.3 (24.4–44.2)	260,000	31.8 (24.1–39.5)	490,000
Asian[¶]	14.0 (10.7–17.3)	910,000	4.6 (2.8–6.4)	340,000	9.0 (7.1–10.9)	1,260,000
Multirace	27.7 (19.9–35.5)	520,000	22.9 (16.5–29.2)	460,000	25.2 (20.4–30.0)	990,000

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Socioeconomically Disadvantaged Populations More Likely to be Smokers

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Overall	17.5 (16.6–18.5)	20,660,000	13.5 (12.8–14.3)	17,110,000	15.5 (14.8–16.1)	37,770,000
Education level**						
0–12 yrs (no diploma)	28.9 (25.7–32.1)	3,760,000	19.5 (17–22)	2,590,000	24.1 (22.1–26.2)	6,360,000
≤8th grade	22.4 (16.9–27.8)	1,100,000	10.4 (7.7–13.1)	530,000	16.2 (13.3–19.2)	1,630,000
9th–11th grade	35.1 (30.4–39.8)	2,070,000	26.2 (22.5–29.8)	1,530,000	30.7 (27.6–33.7)	3,610,000
12th grade (no diploma)	26.7 (20.7–32.8)	580,000	22.8 (14.8–30.9)	520,000	24.8 (19.8–29.7)	1,100,000
GED	45.5 (38.7–52.2)	1,350,000	36.1 (30.1–42.0)	1,140,000	40.6 (36.1–45.1)	2,490,000
High school graduate	23.1 (21.1–25.1)	5,120,000	16.5 (14.9–18.2)	3,860,000	19.7 (18.4–21.1)	8,980,000
Some college (no degree)	19.8 (17.6–22.1)	3,420,000	18.1 (16.4–19.8)	3,370,000	18.9 (17.6–20.3)	6,790,000
Associate degree	17.1 (14.7–19.6)	1,990,000	16.4 (14.4–18.5)	2,330,000	16.8 (15.2–18.3)	4,330,000
Undergraduate degree	9.1 (7.7–10.5)	1,990,000	6.4 (5.4–7.5)	1,530,000	7.7 (6.8–8.6)	3,520,000
Graduate degree	5.5 (4.1–6.9)	730,000	3.5 (2.5–4.5)	510,000	4.5 (3.6–5.3)	1,250,000

Education GED 40.6

Education Undergrad 7.7 Grad 4.5

Socioeconomically Disadvantaged Populations More Likely to be Smokers

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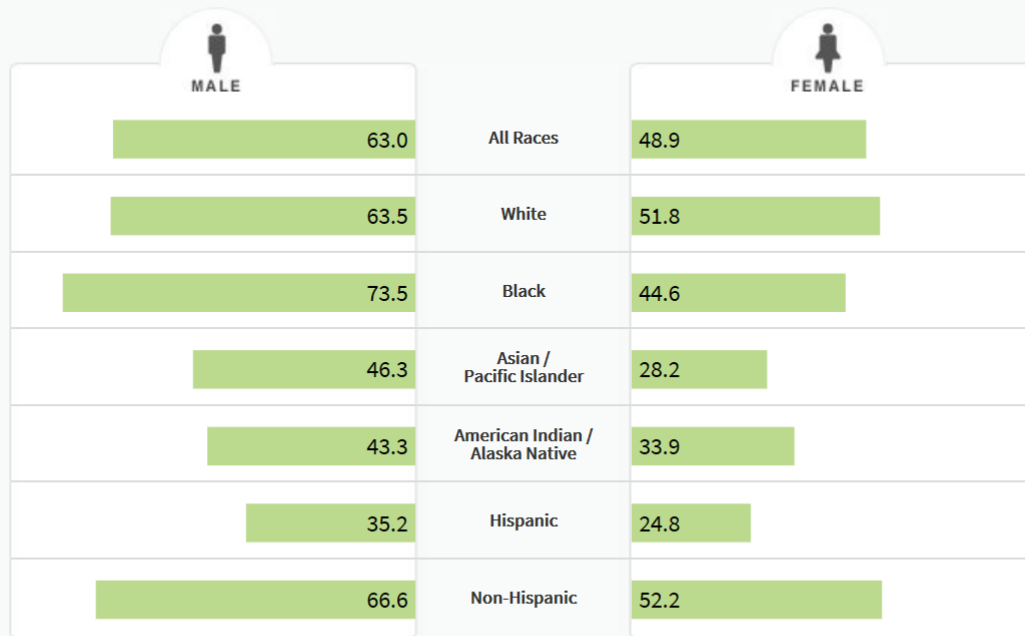| Characteristic	Males (n = 14,991)		Females (n = 18,037)		Total (n = 33,028)	
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Overall	17.5 (16.6–18.5)	20,660,000	13.5 (12.8–14.3)	17,110,000	15.5 (14.8–16.1)	37,770,000
Poverty status[††]						
At or above poverty level	16.4 (15.4–17.3)	16,380,000	12.3 (11.5–13.0)	12,650,000	14.3 (13.6–14.9)	29,030,000
Below poverty level	28.8 (25.8–31.9)	3,500,000	22.7 (20.4–25.0)	3,770,000	25.3 (23.4–27.2)	7,270,000
Unspecified	14.2 (10.9–17.5)	770,000	10.2 (7.5–12.8)	690,000	12.0 (9.8–14.1)	1,470,000
Disability/Limitation* **						
Yes	25.5 (22.8–28.2)	2,470,000	18.0 (16.1–20.0)	2,320,000	21.2 (19.6–22.9)	4,790,000
No	16.4 (15.3–17.6)	6,360,000	12.6 (11.6–13.6)	5,630,000	14.4 (13.6–15.2)	11,990,000
Sexual orientation[†††]						
Straight	17.3 (16.3–18.2)	19,230,000	13.5 (12.7–14.2)	15,920,000	15.3 (14.6–16.0)	35,160,000
Gay/Lesbian/Bisexual	23.8 (17.6–30.1)	620,000	17.9 (13.8–22.0)	600,000	20.5 (16.7–24.3)	1,230,000
Serious psychological distress (Kessler Scale)[§§§]						
Yes	39.3 (33.3–45.2)	1,290,000	33.6 (28.8–38.5)	1,720,000	35.8 (32.1–39.6)	3,010,000
No	16.8 (15.9–17.8)	18,610,000	12.7 (11.9–13.5)	14,850,000	14.7 (14.0–15.4)	33,460,000

**Poverty
25.3 vs 14.3**

**Disability
21.2 vs 14.4**

**Sexual Orient
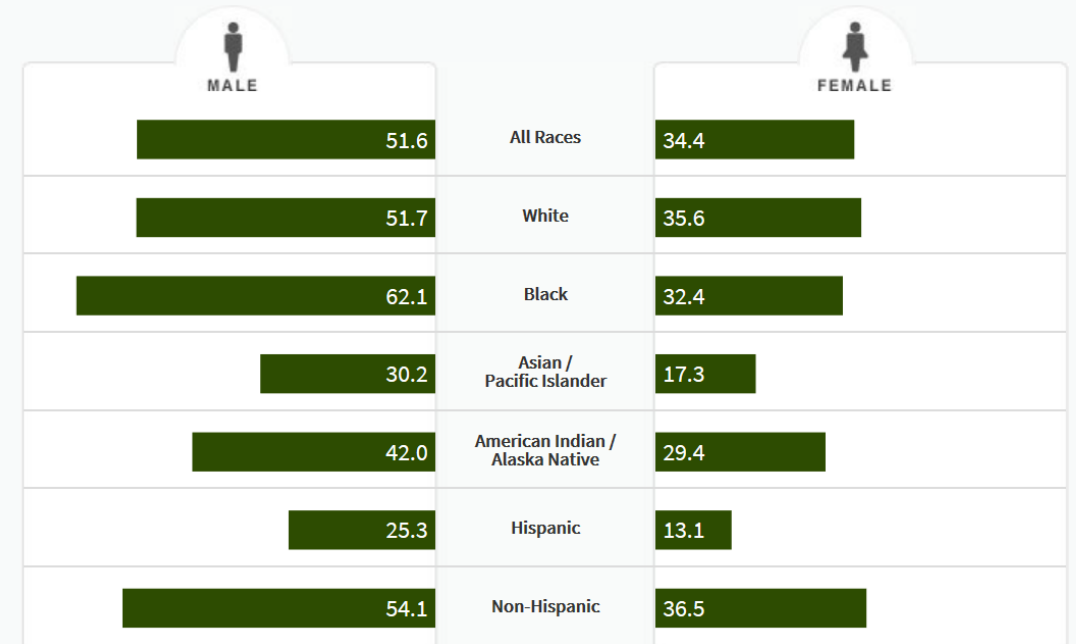20.5 vs 15.3**

**Psychol Distress
35.8 vs 14.7**

14

Overall Lung Cancer Incidence and Mortality Highest in African American Men Despite Similar Smoking Rates to Whites

Number of New Cases per 100,000 Persons by Race/Ethnicity & Sex: Lung and Bronchus Cancer

MALE		FEMALE
63.0	All Races	48.9
63.5	White	51.8
73.5	Black	44.6
46.3	Asian / Pacific Islander	28.2
43.3	American Indian / Alaska Native	33.9
35.2	Hispanic	24.8
66.6	Non-Hispanic	52.2

SEER 21 2012-2016, Age-Adjusted

Number of Deaths per 100,000 Persons by Race/Ethnicity & Sex: Lung and Bronchus Cancer

MALE		FEMALE
51.6	All Races	34.4
51.7	White	35.6
62.1	Black	32.4
30.2	Asian / Pacific Islander	17.3
42.0	American Indian / Alaska Native	29.4
25.3	Hispanic	13.1
54.1	Non-Hispanic	36.5

U.S. 2012-2016, Age-Adjusted

https://seer.cancer.gov/statfacts/html/lungb.html

National Lung Screening Trial Results

More Lung Cancers found in LDCT Arm
- Total Cases
  - LDCT 1060
  - CXR 941
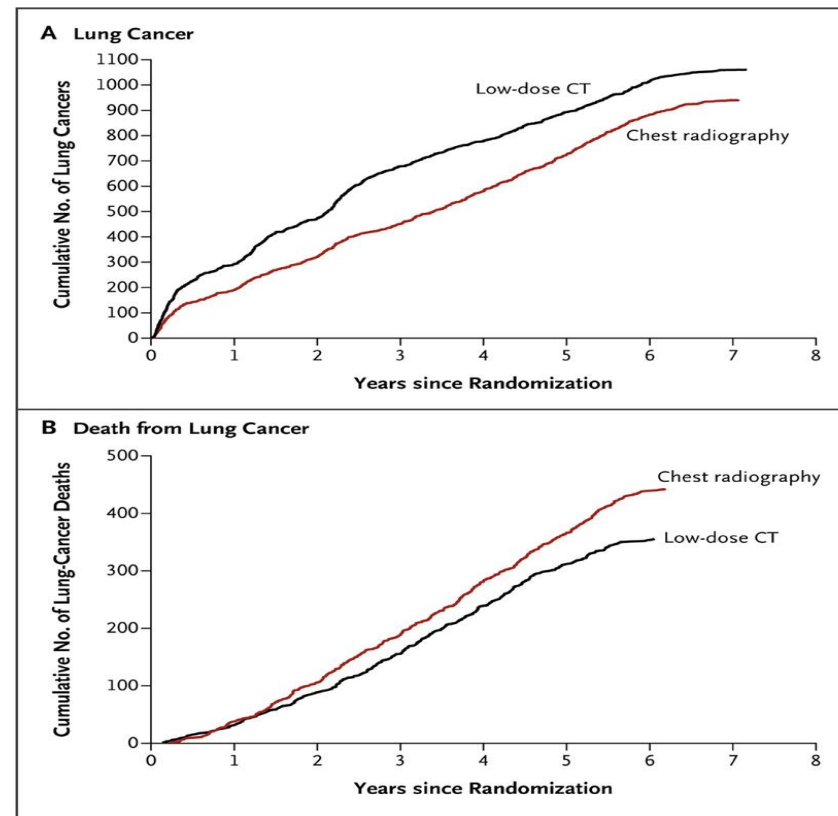- Cases per 100k person years
  - LDCT 645
  - CXR 572

Difference primarily early stage disease

More Lung Cancer Deaths in CXR Arm
- Total Deaths
  - LDCT 356
  - CXR 443
- Deaths per 100k person years
  - LDCT 247
  - CXR 309

20% Reduction in lung cancer mortality with LDCT

6.7% Reduction in all cause mortality

The National Lung Screening Trial Research Team . N Engl J Med 2011;365:395-409.

Benefits of Lung Cancer Screening – Stage Shift Leading to Reduced Mortality

LDCT (Table 5 NLST)

Stage	Screen Detected		Negative Screening		Total During Screening		No Screening Test (Most During Followup)		Overall	
			During Screening							
IA	329	52%	5	11%	334	49%	82	23%	416	40%
IB	71	11%	2	5%	73	11%	31	9%	104	10%
IIA	26	4%	2	5%	28	4%	7	2%	35	3%
IIB	20	3%	3	7%	23	3%	15	4%	38	4%
IIIA	59	9%	3	7%	62	9%	37	10%	99	10%
IIIB	49	8%	15	34%	64	9%	58	16%	122	12%
IV	81	13%	14	32%	95	14%	131	36%	226	22%
Total	635		44		679		361		1040	
Early (1 & 2)	446	70%	12	27%	458	67%	135	37%	593	57%
Late (3 & 4)	189	30%	32	73%	221	33%	226	63%	447	43%

CXR (Table 5 NLST)

| Stage	Screen Detected		Negative Screening		Total During Screening		No Screening Test (Most During Followup)		Overall	
			During Screening							
IA	90	33%	16	12%	106	16%	90	17%	196	19%
IB	41	15%	6	4%	47	7%	46	9%	93	9%
IIA	14	5%	2	1%	16	2%	16	3%	32	3%
IIB	11	4%	6	4%	17	3%	25	5%	42	4%
IIIA	35	13%	21	16%	56	8%	53	10%	109	10%
IIIB	27	10%	24	18%	51	8%	71	14%	122	12%
IV	57	21%	60	44%	117	17%	218	42%	335	32%
Total	275		135		410		519		929	
Early (1 & 2)	156	57%	30	22%	186	45%	177	34%	363	39%
Late (3 & 4)	119	43%	105	78%	224	55%	342	66%	566	61%

SEER Relative Survival Rates in the US by Stage at Diagnosis for Lung Cancer
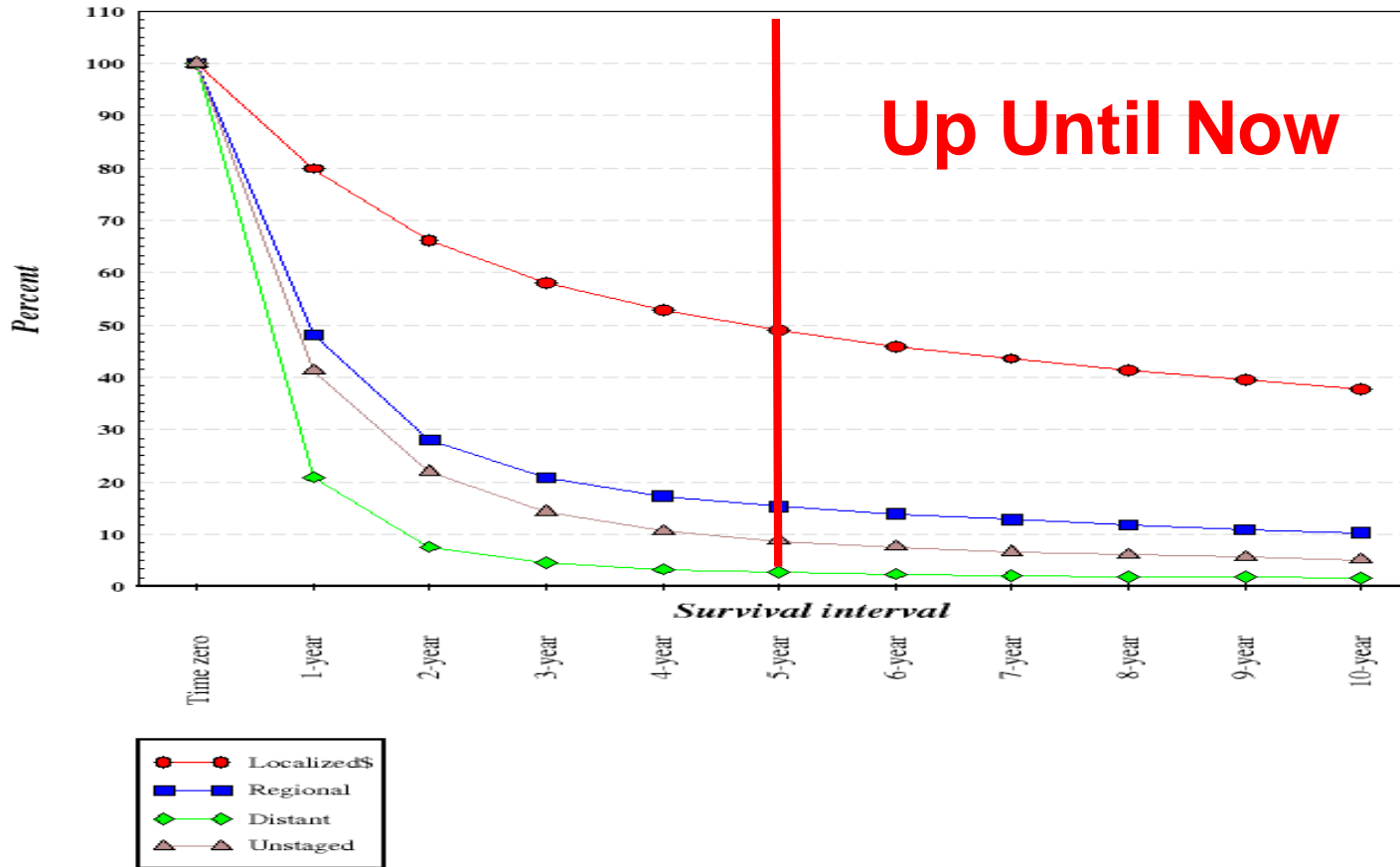
The Potential of Early Detection
What % survival after a "Complete Resection?"
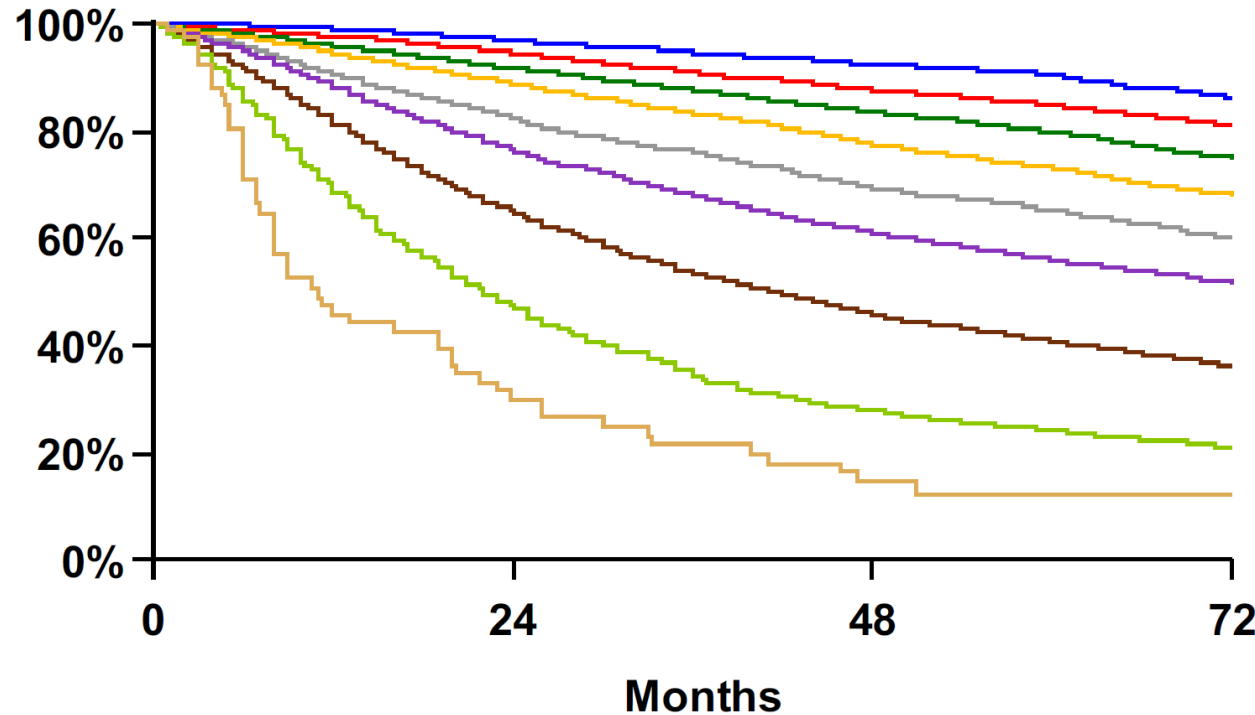
Proposed	Events / N	MST	24 Month	60 Month
IA1	139 / 1389	NR	97%	90%
IA2	823 / 5633	NR	94%	85%
IA3	875 / 4401	NR	92%	80%
IB	1618 / 6095	NR	89%	73%
IIA	556 / 1638	NR	82%	65%
IIB	2175 / 5226	NR	76%	56%
IIIA	3219 / 5756	41.9	65%	41%
IIIB	1215 / 1729	22.0	47%	24%
IIIC	55 / 69	11.0	30%	12%

90%

Months

Overall Survival. Pathologic Stage   **Goldstraw(2016). 8th Edition. *J Thorac***
Oncol, 11(1), 39-51.

Eligibility NELSON vs NLST

NELSON

Age: 50-75

Current or quit < 10 yrs ago

> 10 cig/day x 30 yrs (15PY)

> 15 cig/day x 25 yrs (18.75 PY)

De Konin H, Van Der Aalst CM, ten Haaf K, Oudkerk M on behalf of NELSON investigators. Effects of volume CT lung cancer screening. Mortality results of the NELSON randomized, controlled population-based screening trial. WCLC 2018; Abstract PLo2.05.

NLST

Age: 55-74

Current or quit < 15 yrs ago

> 30 Pack Years (PY)

Smokers With HIV More Likely to Get Lung Cancer Than Smokers Without HIV. The Center for AIDS Information and Advocacy. Nov 2015.The Body Pro Website. http://www.thebodypro.com/content/76717/smokers-with-hiv-more-likely-to-get-lung-cancer-th.html Accessed Jan 8, 2019

IASLC

INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER

IASLC 19th World Conference on Lung Cancer
September 23–26, 2018   Toronto, Canada

WCLC2018.IASLC.ORG

#WCLC2018

NLST & NELSON: Lung cancer CT screening Mortality data

Male v Female ratio	
NLST[+]	41/59
NELSON	16/84

Percent LC Mortality Decrease			
Trial	Men	Women	50:50 M/F
NLST*	8%	27%	**18%**
NELSON**	26%	39-61%	**33 – 44%**

Pinsky et al. The National Lung Screening Trial:. *Cancer* 2013; **119**(22): 3976-83.   *Aberle, et al. The National Lung Screening Trial: overview and study design. *Radiology* 2011; **258**(1): 243
**Effects of Volume CT Lung Cancer Screening: Mortality Results of the NELSON Randomised-Controlled Population Based Trial De Koning et al 2018

Multicentric Italian Lung Detection (MILD) Trial shows 39% Lung Cancer Mortality Reduction at 10 Years and 20% Reduction Overall Mortality

4,099 participants randomized:
- Screening arm (n=2,376) - LDCT for a median period of six years
  - Annual (n=1190) or Biennial (n=1186)
- Control arm (n=1,723) no screening

≥ 20 pack-years smoking history
Current or former smoker <10 years quit
49 to 75 years old
No history of cancer within last 5 years

Results:
Screening arm vs control arm
- 39% reduced risk of LC mortality at 10 years (HR 0.61, 95%CI 0.39-0.95)
- 20% reduction of overall mortality (HR: 0.80, 95%CI 0.62-1.03)

- LDCT benefit improved beyond the 5th year of screening, with a 58% reduced risk of LC mortality (HR 0.42, 95%CI 0.22-0.79), and 32% reduction of overall mortality (HR: 0.68, 95%CI 0.49-0.94).

German Lung cancer Screening Intervention (LUSI) Trial shows Lung Cancer Mortality Reduction for Women

4,052 participants randomized:

- Screening arm (n=2,029) – 5 rounds of annual screening with LDCT
- Control arm (n=2,023) no screening
- Average 8.8 years follow-up

≥ 15 pack-years smoking history
Current or former smoker <10 years quit
50 to 69 years old

Results:
Screening arm vs control arm

- 24% mortality reduction in screening arm but not statistically significant (p=0.21)
- HR mortality for subgroup women 0.31 (95%CI: 0.10 - 0.96], p=0.04)
- HR mortality for subgroup men 0.94 not statistically significant (p=0.81)

High Risk Population Recommended for Annual Lung Cancer Screening by USPSTF & CMS

Covered by Insurance and Medicare without a Co-Pay

Age
55 to 80 (age 77 for Medicare)

Smoking History
30 pack years or more
- 1 pack a day for 30 years/2 packs per day for 15 years etc.

Current or Former Smoker Quit within the last 15 years

Asymptomatic for lung cancer symptoms

Low CT Lung Screening Rates in Eligible Current & Former Smokers

National Health Interview Survey results in 2015

- Only 2.1% eligible population had a CT lung screening exam

- 2.7% indicated they had a chest x-ray to screen for lung cancer (Huo et al. Jama Internal Medicine 2017)

- Only 3.9% of the 6.8 million smokers eligible for lung cancer screening received it; a statistically insignificant increase from 3.3% in 2010 despite advent of insurance & Medicare coverage of screening (Jemal & Fedewa, JAMA Oncology 2017)

ACR Lung Cancer Screening Registry prevalence scans entered through June 2017 = 244,331 ➔ 2.7% of the 9M eligible US population (https://www.acr.org/Quality-Safety/National-Radiology-Data-Registry/Lung-Cancer-Screening-Registry)

Recent analysis of 2017 Behavioral Risk Factor Surveillance data across 10 states indicated 14.4% of those eligible had a CT scan to check for lung cancer in the previous 12 months with significant state to state variation

Whitney E. Zahnd, Jan M. Eberth, Lung Cancer Screening Utilization: A Behavioral Risk Factor Surveillance System Analysis, American Journal of Preventive Medicine, 2019, https://doi.org/10.1016/j.amepre.2019.03.015.

Challenges for Patients

- Access to care

- LCS selection criteria

- Stigma, implicit bias, & nihilism

- Shared decision making

- Perceived risk of lung cancer

Lack of awareness of option for CT lung screening

Qualitative studies indicate both patients and healthcare providers are mostly unaware of about the option for CT lung screening and about who is recommended to be screened

- Lisa Carter Harris' qualitative study long-term smokers on knowledge & beliefs lung cancer screening found (Carter Harris et al. 2015)

  - Lack of knowledge about lung cancer causes and risks
  - Perceived barriers to screening were inconvenience, distrust and stigma
  - Perceived benefits included finding lung cancer early, peace of mind and motivation to quit smoking.

Lack of awareness of option for CT lung screening

In a qualitative study on knowledge about, and barriers to lung cancer screening in primary care providers and high risk patients, the patients reported no healthcare provider had ever talked to them about lung cancer screening (Simmons et al. 2017)

- Top barriers mentioned by patients was fear of finding out they had cancer, cost, false positives and inconvenience

- Majority indicated they would get screened if recommended by their doctor

Analysis of 2017 HINTS data showed low percentage of lung cancer screening discussions occurring between physicians and patients (Rai et al. 2019)

- 18% of current smokers and 10.5% of former smokers reported having a discussion in the past year with their healthcare provider about lung cancer screening

Physician Recommendation Primary Reason for Getting Screened

Baseline: Lung Screening and Lung Cancer Characteristics

	Usual Care (N=46)	Telephone Counseling (N=46)
Lung Screening history (% yes)	47.8%	39.1%
Primary reasons for screening		
Doctor recommendation	82.6%	82.2%
Peace of mind about lung cancer	80.4%	84.4%
Personal History of Cancer (e.g., skin, prostate, breast)	26.7%	26.7%
Family History of Lung Cancer	34.8%	44.4%
Perceived worry about developing LC (% very much/extremely)	45.6%	44.5%
Perceived risk about developing LC (% higher/much higher risk than others)	50%	48.9%

No significant group differences

0

BACKGROUND: Low-dose computed tomography (LDCT) of the chest for lung cancer screening of heavy smokers was given a 'B' rating by the U.S. Preventive Services Task Force (USPSTF) in 2013, and gained widespread insurance coverage in the U.S. in 2015. Lung cancer screening has since

Lisa Carter-Harris et al **trust in referring physician** key reason for people getting screened – similar to other cancer screening tests

three investigators.

RESULTS: Four primary themes emerged as motivations for completing LDCT lung cancer screening: 1) trust in the referring clinician; 2) early-detection benefit; 3) low or limited harm perception; and 4) friends or family with advanced cancer.

CONCLUSION: Participants in our study were primarily motivated to screen for lung cancer based on perceived benefit of early-detection, absence of safety concerns, and personal relationships. Our findings provide new insights about patient motivations to screen, and can potentially be used to improve lung cancer screening uptake and shared decision-making processes.

Disadvantaged populations less likely to have a regular physician, less likely to have trust in medical professionals

Age and Smoking History Don't Capture Everyone at Equivalent Risk
AA's less likely to meet current screening criteria than whites

AA men more likely to exceed the PLCOm2012 screening risk threshold for lung cancer without meeting the CMS screening selection criteria[1]

Retrospective study of people diagnosed with lung cancer showed fewer AAs met eligibility criteria for lung cancer screening than European Americans[2]
- Lower tobacco exposure
- Younger age at time of diagnosis

In a survey of 143 patients likely to meet USPSTF criteria for lung cancer screening in a Rhode Island health care organization nonblack patients were 90% more likely to meet criteria compared with black patients[3]
- Black patients had lower tobacco exposure.

1. Fiscella K, Winters P, Farah S, Sanders M, Mohile SG. Do lung cancer eligibility criteria align with risk among blacks and Hispanics? PLoS One 2015;10:e0143789.
2. Ryan BM. Differential eligibility of African Americans and European Americans lung cancer cases using LDCT screening guidelines. BMJ Open Resp Res 2016;3:e000166.
3. Japuntich SJ, Krieger NH, Salvas AL, Carey MP. Racial disparities in lung cancer screening: An exploratory investigation. Journal of the American Medical Association. 2017;110:424-7.

Age and Smoking History Don't Capture Everyone at Equivalent Risk
Prospective Community Cohort(48,364): 17% AA Eligible vs 31% Whites
Subset Diagnosed Lung Cancer(1269): 32% AA Eligible vs 56% Whites

Figure 1. Distribution and Median Smoking Pack-Years at Diagnosis by Race for Incident Lung Cancer Cases
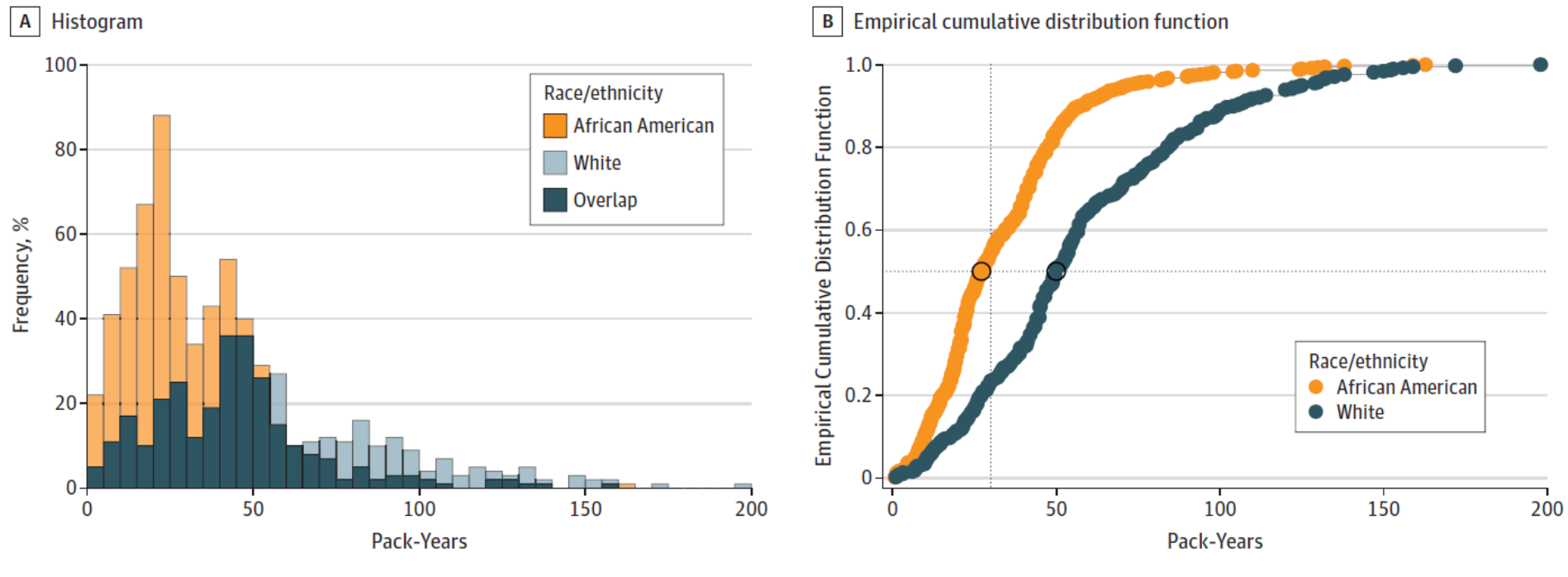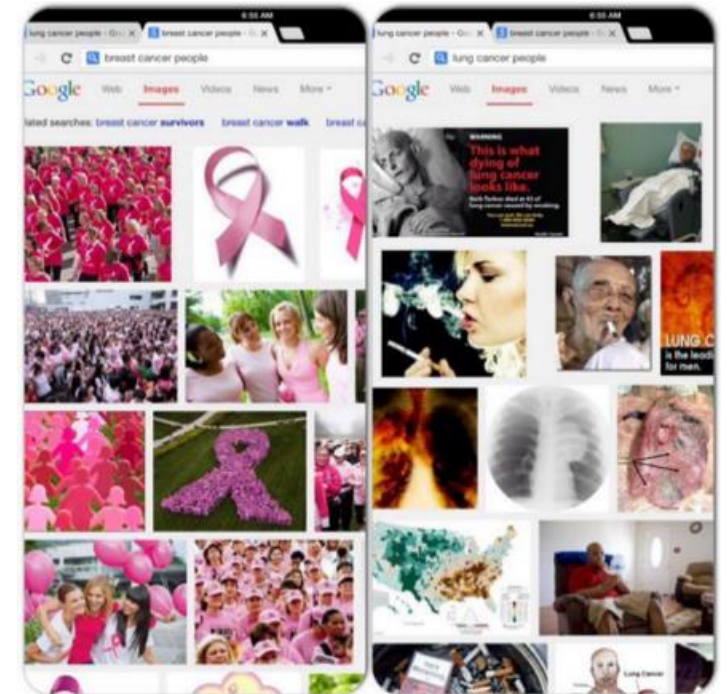
AA Diagnosed with Lower Pack Year Smoking History and at Younger Age

Aldrich MC, Mercaldo SF, Sandler KL, Blot WJ, Grogan EL, Blume JD. Evaluation of USPSTF Lung Cancer Screening Guidelines Among African American Adult Smokers. JAMA Oncol. Published online June 27, 2019. doi:10.1001/jamaoncol.2019.1402

Lung Cancer Screening is Different Due to Stigma Associated with Smoking

- Stigma associated with lung cancer due to stigmatization of smokers
  - Denial
  - Self-blame
  - Nihilism
  - Fear of stigma/anger from loved ones/others

People with lung cancer blamed and/or blame themselves for their disease

http://cancergeek.wordpress.com/2013/11/16/cancer-the-harsh-story-of-lung-cancer-vs-breast-cancer/

Smoking ubiquitous in 1940's thru 1980 – Time when most now eligible for Lung Cancer Screening Programs Started Smoking
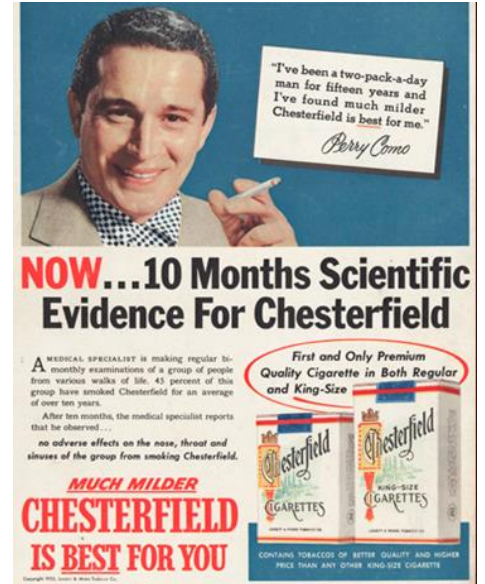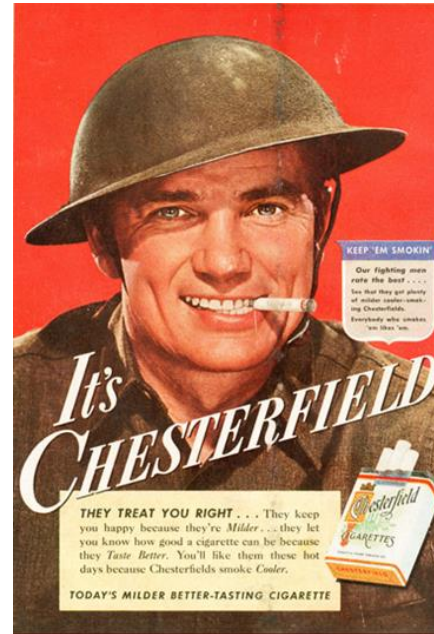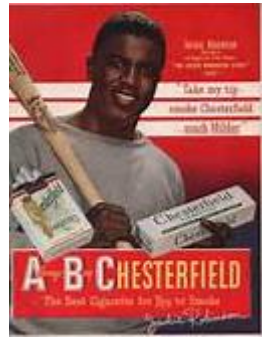
Many clinicians practicing today were not around when smoking was glamorized and may not understand or empathize with their patients who continue to smoke or used to smoke

Disadvantaged Populations Experience "Double Stigma"

Health care provider implicit bias and differences in trust and perceptions of physicians[1,2]

Stigma associated with gender, sexual orientation, mental illness, disability, race, or ethnicity in addition to the stigma associated with smoking.

1.Penner LA, Dovidio JF, Gonzalez R, et al. The effects of oncologist implicit racial bias in racially discordant oncology interactions. J Clin Oncol 2016;34:2874-80.
2.Gordon HS, Street RL, Sharf BF, Kelly A, Souchek J. Racial differences in trust and lung cancer patients' perceptions of physician communication. J Clin Oncol 2006;24:904-9.

CMS Requirements for Lung Cancer Screening

- Lung cancer screening counseling and shared decision making dedicated visit prior to initial screen with physician or qualified non-physician practitioner
  - Use of one or more decision aids
    - Benefits and harms of screening
    - Follow-up diagnostic testing
    - Over-diagnosis
    - False positive rate
    - Total radiation exposure
  - Counseling on
    - Importance of adherence to annual lung cancer LDCT screening
    - Impact of comorbidities
    - Ability or willingness to undergo diagnosis and treatment
    - Importance of maintaining cigarette smoking abstinence if former smoker
    - Importance of smoking cessation if current smoker
    - Furnishing of information about tobacco cessation interventions

Barriers Shared Decision Making – Physician Perspective

- Time

- Already do it

- Not applicable – patients don't want it

- Lack of organizational support

- Lack of decision aids

Barriers Shared Decision Making – Patient Perspective

- Not aware of option for shared decision making

- Health literacy

- Cultural Issues

- Demographic or geographic issues
  - Rural
  - Older Americans
  - Language

Physician Concerns About Lung Cancer Screening

- Perceived effectiveness of screening

- High false positive rate

- Potential for invasive intervention for benign disease

- Potential for overdiagnosis

- Follow-up for incidental findings

- Radiation exposure for follow-on imaging

- Cost for follow-on tests and interventions

- Hard to determine if patient is eligible

- Time for the shared decision making discussion

- Lack of a decision aid

- Uncomfortable having shared decision making discussions

- Patient health literacy level makes discussion of risks and benefits difficult

- Patients don't ask about lung cancer screening

Harms Overstated & Misrepresented

What is the **false positive rate** in modern clinical practice CTLS?

98%, 60%, 50%, 23%, 12%, 7%, 2%

Patient Anxiety – **Little/No Evidence**

"Permission to Smoke" – **Little/No Evidence**

Overdiagnosis

What is the rate of overdiagnosis in the NLST when using modern reporting and work up algorithms?

70%, 50%, 18%, 3%

Significant Incidental Findings

What is the rate of significant incidental findings in clinical CTLS practice?

70%, 40%, 10%, 6%, 4%,2%

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So What **ARE** the False Positive Rates for CT Lung Screening?

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812   AUGUST 4, 2011   VOL. 365   NO. 5

Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

T0: 26.3%
T1: 27.2%
T2: 15.9%
Overall: 23.3%

Annals of Internal Medicine

ORIGINAL RESEARCH

Performance of Lung-RADS in the National Lung Screening Trial

A Retrospective Assessment

Paul F. Pinsky, PhD; David S. Gierada, MD; William Black, MD; Reginald Munden, MD; Hrudaya Nath, MD; Denise Aberle, MD; and Ella Kazerooni, MD

T0: 12.6%
T1: 5.3%
T2: 5.1%
Overall: 7.8%

Original Research

JNCCN   The official journal of the NCCN National Comprehensive Cancer Network®
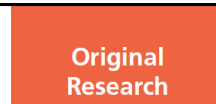
NCCN Guidelines as a Model of Extended Criteria for Lung Cancer Screening

Brady J. McKee, MD; Shawn Regis, PhD; Andrea K. Borondy-Kitts, MS, MPH; Jeffrey A. Hashim, MD; Robert J. French Jr, MD; Christoph Wald, MD, MBA, PhD; and Andrea B. McKee, MD

T0: 10.6%
T1: 5.2%
T2: 5.0%
Overall: 7.6%

RESCUE LUNG RESCUE LIFE SOCIETY   *Rescuing lives from lung cancer today and tomorrow*

False Positive Rates for Lung Cancer Screening Comparable to Mammography

Screening Round	False Positive Rate				False Discovery Rate			
	NLST	NLST LR	LHMC	MG	NLST	NLST LR	LHMC	MG
T0	26.3%	12.6%	10.6%	~20%	96.2%	92.8%	83.1%	97%
T1	27.2%	5.3%	5.2%	5-10%	97.6%	90.3%	78.2%	95%
T2	15.9%	5.1%	5.0%	5-10%	94.8%	87.2%	84.6%	95%

NLST: National Lung Screening Trial;   NLST LR: Pinsky et al NLST conversion;

LHMC: Lahey CTLS program;   MG: Mammography (nationwide)

Lahey Hospital & Medical Center

Why Is This Important?

"In one study, 82% of patients reported that they would undergo LDCT lung screening if recommended by their physician. Another study found that approximately 85% of LCS-adherent patients reported 'trust in their provider' as a reason for undergoing screening."

Lewis et al. J Natl Compr Canc Netw 2019;17(4):339–346

*"Computed tomography (CT), for instance, produces a high false positive rate of 96.4%, which is **likely to hinder the adoption of CT for population screening.**"*

*"**Providers viewed study results skeptically, particularly the 95% false-positive rate,** the need to screen 320 patients to prevent 1 lung cancer death, and the small proportion of minority participants."*

*"Although the 20% relative reduction in lung cancer mortality in the NLST low-dose computed tomography (CT) screening arm is encouraging, it belies a false positive rate among screening results of 96.4%, **which has resulted in some pause among clinicians and payers alike for immediate widespread adoption of the technique.**"*

LCS may provide a "teachable moment"

LCS clinical trails and studies show improved quit rates for those in a screening program (NLST, Mayo Clinic)

In the first successful randomized trial of its kind, researchers have provided preliminary evidence that telephone-based smoking cessation counseling given to smokers shortly after undergoing LCS can be effective at helping people stop smoking.

Townsend CO, Clark MM, Jett JR, et al. Relation between smoking cessation and receiving results from three annual spiral chest computed tomography scans for lung carcinoma screening. Cancer. 2005;103(10):2154-2162.
Tammemägi MC, Berg CD, Riley TL, Cunningham CR, Taylor KL. Impact of lung cancer screening results on smoking cessation. J Natl Cancer Inst. 2014;106(6):dju084.
. Taylor KL, Hagerman CJ, Luta G, et al. Preliminary evaluation of a telephone-based smoking cessation intervention in the lung cancer screening setting: A randomized clinical trial. Lung Cancer. 2017;108:242-24

Smoking Cessation Results in a Large Clinical LCS Program

- Point prevalence quit rate 20.8% (141/678)
- Annualized rate 14.5% vs 5% general population
- Relapse rates 10 to 20 percentage points lower than the general population
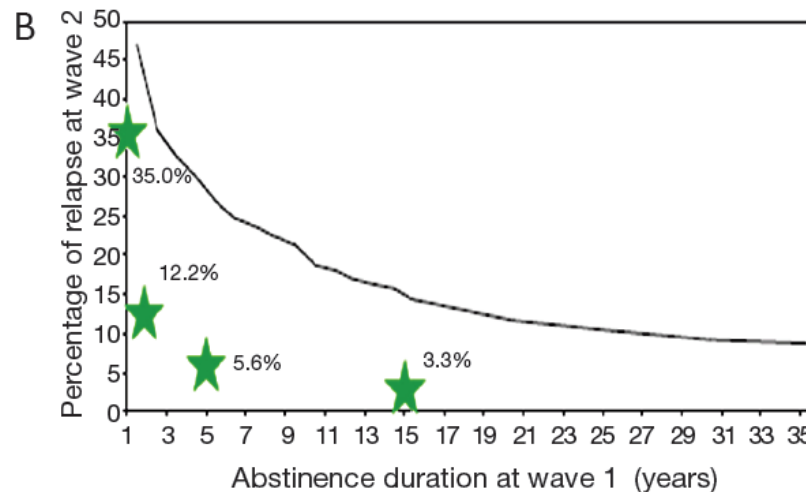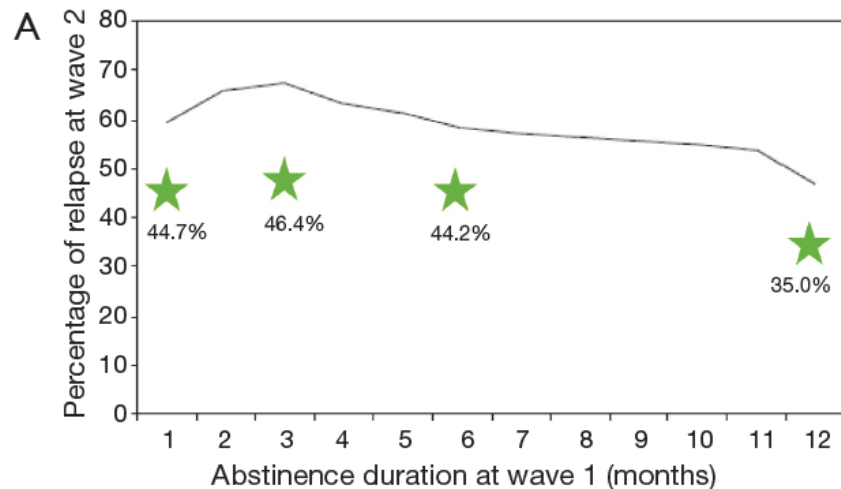
Borondy Kitts AK, McKee AB, Regis SM, Wald C, Flacke S, McKee BJ. Smoking cessation results in a clinical lung cancer screening program. J Thorac Dis. 2016;8(Suppl 6):S481-487.

Studies show smokers and former smokers typically underestimate their risk of lung cancer and overestimate the "curability"

2003 Health Information National Trends Survey (HINTS)

- Over half of current smokers thought their risk was 2X or less that of non-smokers (actual relative risk for this group 9.5-21.6X depending on cigarettes per day)

And overestimated the percentage alive 10 years after diagnosis

- Only 37.9% of current smokers and 43.2% of former smokers gave the correct answer of <25% (less than 10% are alive 10 years after diagnosis)

In NLST African American Former Smokers More Likely to Underestimate Lung Cancer Risk Than Whites

Weinstein ND, Marcus SE, Moser RP. Smoker's unrealistic optimism about their risk. *Tobacco Control.* 2005;14:55-59. doi:10.1136/tc.2004.008375.

Park, E.R., Ostroff, J.S., Rakowski, W. et al. Risk perceptions among participants undergoing lung cancer screening: Baseline results from the National Lung Screening Trial. *Ann Behav Med.* 2009; 37: 268. doi:10.1007/s12160-009-9112-9

Path Forward

- Implement Outreach Programs and Provide Lung Cancer Screening in Underserved Communities at High Risk for Lung Cancer

- Use National Comprehensive Cancer Network Guidelines for Screening Selection Criteria Including Risk Model Screening Selection

- Education to Address Stigma and Clinician Implicit Bias and Nihilism

Form Multidisciplinary State Lung Cancer Screening Coalition & Learning Collaborative

- State DPH, advocacy organizations, medical societies, community organizations – include leaders from AA and other disadvantaged communities

- Develop & implement surveys to identify gaps in access to lung cancer screening

- Co-develop and pilot outreach interventions in communities with highest lung cancer rates; culturally tailored; target both referring physician base and community

- Share lessons learned across state – help implement screening programs in areas of need – Potential for FQHC and ACR designated LCS centers to partner for improved access to screening for underserved populations

Use National Comprehensive Cancer Network (NCCN) high-risk CT lung screening criteria for participant selection

Variable	NCCN Group 1	NCCN Group 2
Age	55-74*	≥50
Smoking history	≥30 pack years	≥20 pack years
Smoking status	Current or former	Current or former
Quit duration	<15 years	Any
Additional risk factors	None required	At least one of the following: 1) history of lung cancer in first degree relative; 2) personal history of chronic lung disease; 3) occupational exposure to known lung carcinogen(s); 4) personal history of smoking-related cancer

*Annual screening can be considered until the patient is no longer eligible for definitive treatment

Including NCCN Recommendation use of Tammemagi PLCOm2012 Lung Cancer Risk model for selecting screening candidates

NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®)

Lung Cancer Screening

Version 3.2018 — January 18, 2018

NCCN.org

NCCN Guidelines for Patients® available at www.nccn.org/patients

and
- Additional risk factors (other than second-hand smoke) that increase the risk of lung cancer to ≥1.3% (see footnote i)

- Footnote i, third sentence modified: It is reasonable to consider using the Tammemagi lung cancer risk calculator to assist in quantifying risk for individuals in this group, considering a 1.3% threshold of lung cancer risk *over a 6 year timeframe* was considered similar to that of the USPSTF (Tammemägi MC, Church TR, Hocking WG, et al. Evaluation of the lung cancer risks at which to screen ever- and never-smokers: screening rules applied to the PLCO and NLST cohorts. PLOS Med 2014;11:1-13).

Malignancy Rates Same for NCCN Group 1 and NCCN Group 2

Table 4. Malignancy Rates

Variable	Total	Group 1	Group 2	P Value
Overall malignancy rate	113/2,927 (3.9%)	85/2,229 (3.8%)	28/698 (4.0%)	.8
Average follow-up, mo	30.4	30.2	31.3	.4
Annualized malignancy rate	1.52%	1.51%	1.54%	1

Pathology shows similarly aggressive histologic subtypes between groups

Patients	NCCN-1 n=32 (%)	NCCN-2 n=15 (%)	P value
Stage 0 (pTis/pTmic)	2 (6)	1 (6)	1
Median Size (cm)	1.6	1.1	0.016
High Grade Pattern			
Solid ≥5%	6 (19)	11 (65)	0.004
Cribriform ≥10%	7 (23)	8 (47)	0.108
Micropapillary ≥5%	9 (29)	5 (29)	1
Invasive Features			
Angiolymphatic	14 (45)	17 (59)	0.547
Visceral Pleural	5 (16)	4 (24)	0.701
STAS	11 (35)	8 (47)	0.541

Education to Address Stigma and Clinician Implicit Bias and Nihilism

- Position lung cancer screening as health choice, similar to mammography & colonoscopy
- Co-develop culturally tailored education materials
  - Address nihilism – no stadium charts, put in patient context, use patient stories
- Public health campaigns raising awareness about stigma and implicit bias
  - Early days of smoking – glamorized by Hollywood stars and sports figures, provided in rations for military personnel, "9 out of 10 doctors recommend Lucky Strikes"
  - Tobacco company practices – spending billions even today ($9.4B in 2016) on advertising to our youth as 90% of regular smokers start by age 18, positioning smoking as a life style choice despite extensive evidence of addiction, increasing addictiveness of cigarettes making smoking harder to quit than heroin or cocaine

Take-Home Points

- Lung cancer screening implementation in the United States is still in the initial stages. Similar to other screening programs at this stage, uptake has been slow.

- Different from other cancer screenings, lung cancer screening is stigmatized because of the close association of lung cancer with smoking.

- Disadvantaged populations are at higher risk for lung cancer mortality. They also face both the stigma associated with smoking and the stigma associated with their race, disability, or socioeconomic status.

- AA men have the highest lung cancer mortality rates in the United States.

- Codeveloping interventions with local and state organizations to raise awareness and develop outreach programs and educational materials are recommended to avoid increasing lung cancer mortality disparity in the AA and other disadvantaged communities.

Appendix - Resources & Additional Information

USPSTF final research plan lung cancer screening released; updated recommendation planned for 2020?

Seems more focused on identifying harms of screening as compared to benefits
Includes research questions on:

- Balance of harms and benefits of using lung cancer risk prediction models (e.g. Tammemagi PLCO2012) vs trail eligibility for screening participant selection,
- Effectiveness and harms of surgical resection and SBRT for Stage 1 NSCLC
- Differences in harms with use of LungRADS or IELCAP approaches
- Differences in effectiveness for subgroups

Contextual questions include assessing barriers to LCS, characteristics screening eligible US adults vs randomized trials e.g.NLST, unintended benefits e.g. coronary artery calcium and emphysema, effectiveness of smoking cessation interventions

Is there a possibility for an "A" grade and/or NCCN Group 2 recommendation with NELSON results?

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Business

America's Heaviest Smokers Don't Want to Know if They Have Cancer

Screening could save 12,000 lives annually, but fewer than 2 percent of those eligible take advantage of it.

2016 data, 3 years after ACS recommendation and one year after CMS coverage

Mammography -28% in 1987, 11 years after ACS recommendation

Colonoscopy -32% in 1980, 20 years after ACS recommendation

Lung cancer screening Lahey– 65% in 2018, 6 years after NCCN recommendation
65% of eligible population screened – Changed the conversation

Lahey Hospital & Medical Center

Why Only 2 Percent of Heavy Smokers Get Lung Cancer Screenings

Why so slow?

Reimbursement
Stigma
Infrastructure
Who does what
Misinformation
Terminology
Resources
Quality
Training
Silos
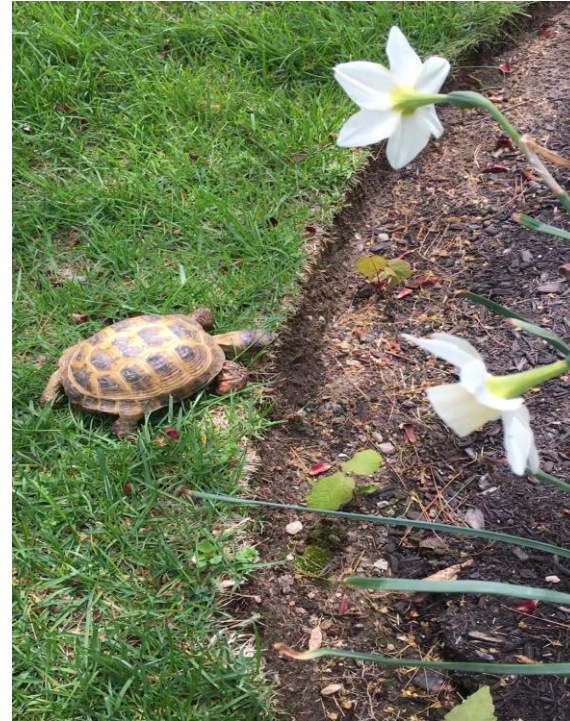
Barriers & Strategies LCS Underserved Populations

Access to Screening

- Provide screening sites in underserved communities
- Consider mobile screening units for rural areas

Patient and Provider Identification

- Educational outreach to primary care physicians
- Provide printed material to physician offices

Relationship with Healthcare Professional

- Recruit minority physicians, nurses and medical assistants
- Address overall patient's health
- Openly discuss mistrust of medical profession, and fear and fatalism around cancer
- Personal testimonials from minority patients

Barriers & Strategies LCS Underserved Populations (continued)

Community Engagement

- Recruit lay health educators from the community (community health workers)
- Develop relationships with national and local minority organizations
- Hold community education events, attend and exhibit at local health fairs and community events
- Build relationships with community healthcare providers

Educating healthcare providers about the history of tobacco use in US may help them better appreciate the environment when most of those eligible for lung cancer screening started smoking and help them address stigma during the shared decision making discussion

- Smoking was common in the 50's and 60's, recommended by government, physicians, celebrities, athletes and glamorized by media
- More than 50% of US adults smoked in 1960
- Tobacco companies made cigarettes more addictive
- More than 90% of regular smokers start by age of 18; 99% by age 26.
- Three out of four teen smokers become adult smokers.
- Smoking is a strong addiction; it is harder to quit smoking than heroin.
- The tobacco industry spends $8.4 billion a year on advertising tobacco products, much of it targeted at our youth.
- Once addicted at a young age, when judgment has not yet matured, many find it very difficult to quit and suffer through a lifetime of addiction.
- Although smoking is a risk factor for many other cancers and other diseases, lung cancer is most closely associated with smoking since more than 80% of lung cancers are caused by tobacco use. This results in stigmatizing people with lung cancer.
- Many, who are eligible for lung cancer screening, especially current smokers, may be reluctant to get screened for fear of being stigmatized, especially by younger physicians that were not alive when smoking was ubiquitous.

Massachusetts Lung Cancer Screening Learning Collaborative: Facilitating and Accelerating Implementation of Statewide Lung Cancer Screening

AK Borondy Kitts MS[1], MPH (borondy@msn.com), CC Thomson MD[2], MPH, R Luckmann MD[3], A. Christie MDPH[4], K. Kelley RN, MSN[2], G Merriam MDPH[4], J Nyambose PhD[4], SM Regis PhD[1], K Steiling MD, MSc[5], AB McKee MD[1]
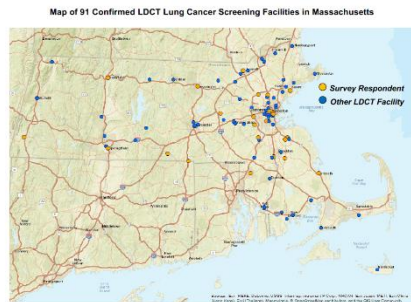
1 Lahey Hospital & Medical Center; 2 Mount Auburn Hospital; 3 University of Massachusetts Medical Center; 4 Massachusetts DPH; 5 Boston Medical Center

Background

Screening patients at high risk for lung cancer with low dose CT scans is recommended by the United States Preventive Services Task Force and covered by all insurers since early 2015. However, only 2-4% of the eligible population nationally has received an initial screening.[1,2] To address the Massachusetts Statewide Cancer Plan's objective to increase the percent of eligible people in Massachusetts receiving a screening within the prior year, the Massachusetts Comprehensive Cancer Prevention and Control Program established a Lung Cancer Work Group (LCWG) to identify and implement strategies to facilitate and accelerate the statewide implementation of lung cancer screening (LCS).

Methods

Massachusetts LCS facilities were surveyed to characterize screening practices, assess barriers to screening implementation, and identify needs for information and support. The LCWG then established a LCS learning collaborative to address needs identified in the survey.

Map of 91 Confirmed LDCT Lung Cancer Screening Facilities in Massachusetts

1. Huo J, Shen C, Volk RJ, Shih YU. Use of CT and chest radiography for lung cancer screening before and after publication of screening guidelines: intended and unintended uptake. JAMA Intern Med. 2017; 177(3):439-441. doi: 10.1001/jamainternmed.2016.9016.
2. Jemal A, Fedewa SA. Lung cancer screening with low-dose computed tomography in the United States—2010 to 2015 JAMA Oncol. 2017;3(9):1278-1281. doi:10.1001/jamaoncol.2016.6416

Findings

37 of 119 (31%) ACR accredited screening sites returned the survey.

Specific Findings Massachusetts Lung Cancer Screening Site Survey
62% had multidisciplinary governance group
82% used a decentralized model for shared decision making
Average number screened/month = 65 with 21% of sites screening over 100 and 45% having capacity to screen over 100/month
36% of sites reported <75% of participants received annual follow up LCS exam and 29% didn't know how many had received their follow up
44% reported participants were evaluated by physician team
24% capture whether radiologist recommendation was completed and/or track complications of biopsies

Most screening sites reported operating below capacity. The greatest challenges and barriers to implementation reported were:
- lack of infrastructure and resources
- coordination of follow-up scans
- limited staff for workload
- data tracking
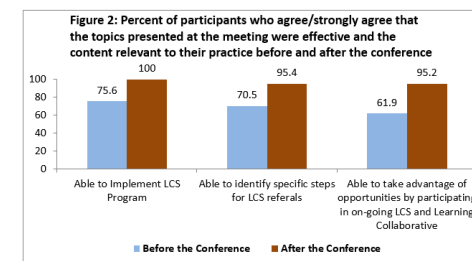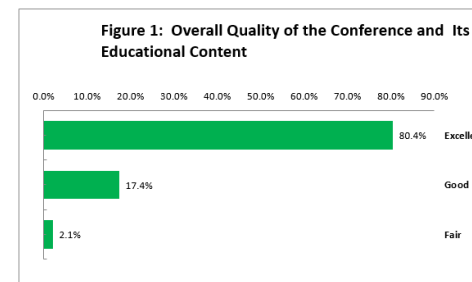- getting accurate information from providers.

LCS facilities indicated a desire to learn more about data tracking, shared decision making, smoking cessation counseling, and documentation of these efforts.

How interested would you and/or other lung cancer screening team members at your facility be in participating in a statewide quality improvement collaborative aimed at assuring patient access to the highest quality LDCT lung screening in Massachusetts?
The collaborative would develop and engage participants in educational activities focused on disseminating best LDCT lung cancer screening practices, and in quality improvement efforts aimed at measuring and comparing progress on quality indicators across all member facilities.

Massachusetts Facilities (N=27)
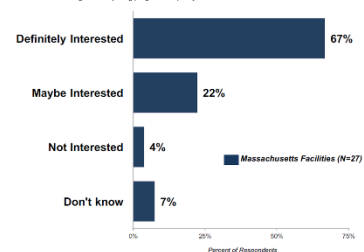
Learning Collaborative

To address desires for information, a statewide learning collaborative was established. The first collaborative meeting was held March 2018 and focused on needs identified in the survey. 59 people from 28 screening sites attended. Feedback identified topics for two upcoming meetings; fall 2018 and spring 2019.

Figure 1: Overall Quality of the Conference and Its Educational Content

Figure 2: Percent of participants who agree/strongly agree that the topics presented at the meeting were effective and the content relevant to their practice before and after the conference

Implications for D&I Research

A learning collaborative at the state level to share best practices may help accelerate adoption of LCS. This model may be applicable to the implementation of other health care programs.

Acknowledgments

LUNG CANCER SCREENING IMPLEMENTATION GUIDE

American Thoracic Society and American Lung Association

LUNG CANCER SCREENING
IMPLEMENTATION GUIDE
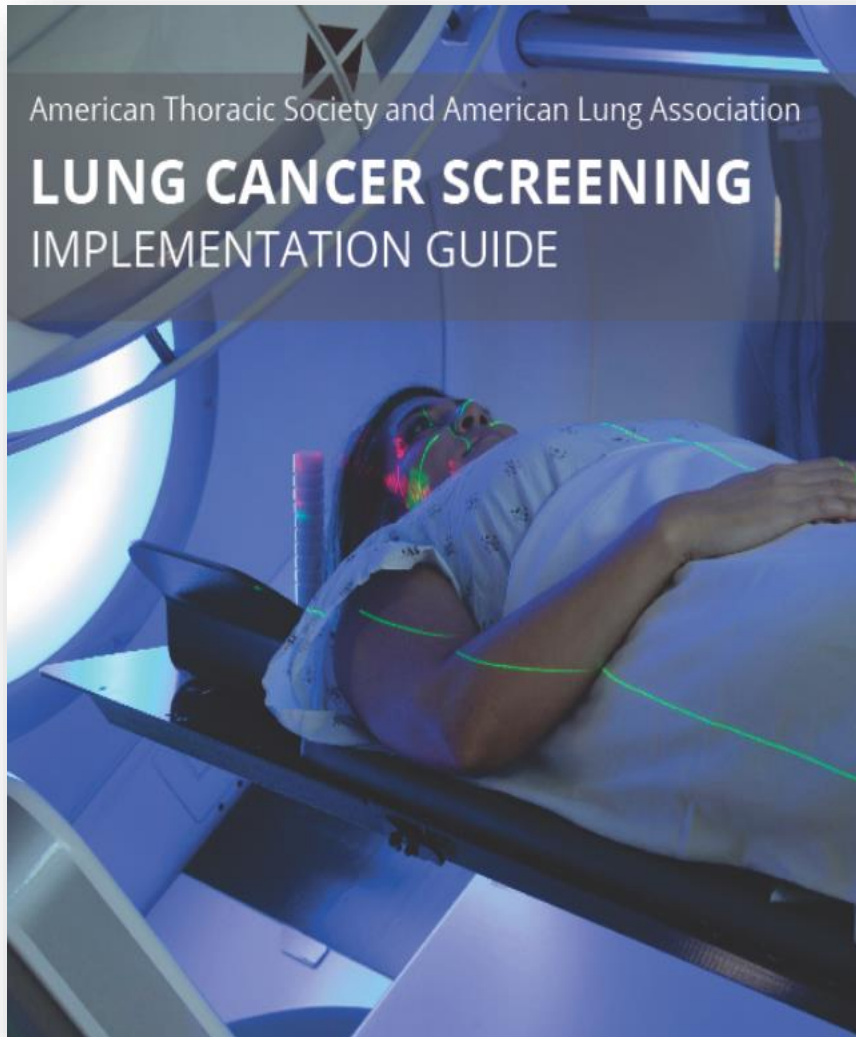
- Intended for community hospitals and healthcare systems

- Highlights potential hurdles along with resources that will aid healthcare systems in establishing their own lung cancer screening program

- Twenty-five experts from 16 institutions representing all geographic regions of the country volunteered for the panel to develop the guide and website

- The website allows users to interact with the guide in easy to navigate sections
  https://www.lungcancerscreeningguide.org/

- For more information visit Lung.org/screening-guide-news

American Thoracic Society
We help the world breathe   PULMONARY · CRITICAL CARE · SLEEP

AMERICAN LUNG ASSOCIATION.   LUNG FORCE.

IASLC ∞
INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER

IASLC 19th World Conference on Lung Cancer
September 23–26, 2018 Toronto, Canada

WCLC2018.IASLC.ORG

#WCLC2018

American Lung Association "Saved by the Scan" campaign raises awareness for CT lung screening

LUNG FORCE. *SAVED BY THE SCAN*   LUNG CANCER RISK   GETTING SCREENED   STORIES   RESOURCES

If you smoked, this new lung cancer screening could save your life.

Take the quiz to see if you should get screened.

Take the Quiz

Screening success stories

Getting screened saved Frank's life.

Frank was saved by the scan and routinely gets screenings to make sure he remains cancer-free. He is so thankful for the technology and this scan. He believes that anyone who has loved ones who fit the profile, should get the low-dose CT scan, because it certainly saved his life.

See More Stories

- **Focus on former smokers who often don't know they are at high risk for lung cancer**

- **245,000 took the on-line quiz**
  - **83,500 met the criteria for screening**

https://www.youtube.com/watch?v=ds3oCZYvtB8

63

WCLC 2018
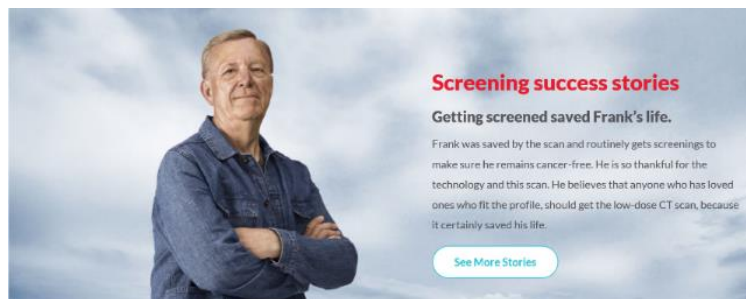
The Lung Cancer Project – Think. Screen. Know

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Customize PDF: Add your logo, contact information, and message

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Customize PDF: Add your logo, contact information, and message

https://www.thelungcancerproject.org/screening/

https://www.thelungcancerproject.org/screening/pdf/patient-screening-guide.pdf

Resources

ALA/ATS Lung Cancer Screening Implementation Guide
https://www.lungcancerscreeningguide.org/

American Lung Association – Saved by the Scan
https://www.lung.org/our-initiatives/saved-by-the-scan /

Lung Cancer Alliance lung cancer screening 2018 campaign (Genentech partner)
https://lungcanceralliance.org/about-screening/

National Lung Cancer Round Table (NLCRT)
https://nlcrt.org/about/
Lung Cancer Atlas
https://nlcrt.org/lung-cancer-atlas/

Shared Decision Making Video - Massachusetts Medical Society Website
http://www.massmed.org/Continuing-Education-and-Events/Online-CME/Courses/SDM---MOD-2/Shared-Decision-Making--Essential-Skills-for-Prostate,-Lung---Breast-Cancer-Screening

What is the False Positive Rate?

"On a population-based level, the FP rate is traditionally defined as the probability of receiving a positive result, given an absence of the disease. In this review, the FP rate will be defined as the number of FPs as a proportion of the total number of screening examinations conducted (i.e. accounting for cases of both the presence and absence of malignant disease). The definition has been modified from the true technical definition as a result of an observed trend, whereby the FP rate is reported in the latter manner by most of the publications concerning mammographic screening." -British Journal of Radiology

What is NOT the False Positive Rate?

"In 1995, Benjamini and Hochberg introduced the concept of the False Discovery Rate (FDR) as a way to allow inference when many tests are being conducted. The FDR is the ratio of the number of false positive results to the number of total positive test results." -Partnership for Assessment and Accreditation of Scientific Practice

RESCUE LUNG RESCUE LIFE SOCIETY

Opportunities for Smoking Cessation Counseling in LCS

Multiple touch points during lung cancer screening; many with opportunities to individualize to the patient

- Point of care – during SDM discussion when ordering LCS exam

- Appointment confirmation letter

- At time of the exam

- Results letter

- Results discussion with healthcare professional

- Setting up the next screening or diagnostic appointment

As little as 3 minutes spent on smoking cessation has been shown to improve quit rates

Incorporating Smoking Cessation Counseling in LCS

- Send all current smokers smoking cessation resource lists with patient letters

- LCS program navigator/coordinator calls all current smokers in the program and discusses smoking cessation options

- Navigator or other provider conducts smoking cessation counseling with all smokers.

- Hospital/medical center smoking cessation program manager contacts all current smokers in the screening program to discuss smoking cessation options

Clinical Practice Guideline for Smoking Cessation – The 5 A's

Guideline Step	Description	Provider Role
Ask	Identify tobacco use	Documented
Advise	Clear, strong, personalized	Reasons to quit
Assess	Willingness	Readiness determined
Assist	Counseling/pharmacotherapy	Strategies explained
Arrange	Schedule follow up	Purpose directed follow up

Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel,Liaisons and Staff, A clinical practice guideline for treating tobacco use and dependence 2008 update: A U.S. Public Health Service Regort. Am J Prev Med. 2008;35:158-176

Smoking Cessation Resources for Patients

Provide list and links for physicians to hand to patients

Offer smoking cessation programs

- Freedom from Smoking

- Telephone counseling

- Individual in-person counseling

- Group counseling

- On-line support groups

Health System Benefit "Not So" Hidden Opportunities with LCS

- High risk current smokers heavily addicted

- Opportunity to study evidence based smoking cessation in this heavily addicted population

- COPD and lung cancer are the 4th and 7th leading cause of death worldwide (Sekene et al, 2012)

- 90% of LC and COPD are attributable to smoking (Lokket et al, 2006;Jemal et al, 2009)

- 36% risk reduction in cardiac mortality associated with smoking cessation (Critchley et al, 2003)

Health System Benefit "Not So" Hidden Opportunities with LCS

- Surgeon General 2014 Report
  - Quitting smoking improves the prognosis of cancer patients
  - All-cause and cancer-specific mortality is improved by smoking cessation
  - Smoking cessation decreases risk of secondary malignancies
- Sustained smoking cessation improves wound healing (Siana et al 1989), reduces hospital LOS (Haskins 2014) and readmission rates (Hassan et al 2014)

Resources to Help You Quit Smoking for Good

Quitting cigarettes and other tobacco products is one of the best things you can do for your health. In the "old" days, the only option for quitting smoking was to go "cold turkey." Things have changed a lot since then, and today there are many different resources available to help you quit tobacco for good. It is hard work, but you can do it and we're here to help in a compassionate and nonjudgmental way.

Lahey Health Resources

FREE in-person coaching with someone who helps people quit
We provide FREE personalized support and education to all Lahey Health patients at Lahey Hospital & Medical Center, Burlington; Lahey Medical Center, Peabody; Addison Gilbert Hospital, Gloucester; and Lahey Outpatient Center, Danvers. For more information, contact us at tobaccotreatment@lahey.org or 781-744-QUIT (7848).

Individualized coaching
One-on-one coaching is available by appointment. Please call 781.744.QUIT (7848) to schedule an appointment.

Group coaching
Information Session: In this FREE 1 hour session you learn how to think differently about tobacco and quitting. Quitting cigarettes and other tobacco products is one of the best things you can do for your health. It is hard work, but you can do it and we're here to help in a compassionate and nonjudgmental way.
Freedom from Smoking® (FFS): This 8 session program builds on strategies discussed in the information session and offers positive in depth coaching to help you quit tobacco. It does not begin with quitting but rather takes you through several lessons first, ensuring that solid information about preparing to quit is given before Quit Day. Because no single cessation technique is effective for all smokers, the program includes a comprehensive variety of evidence-based cessation techniques. To learn more about the FFS program, visit http://www.lahey.org/freedomfromsmoking/.
Support Groups: Consider attending one of our free support groups to share and receive support on your tobacco free journey. All support groups meet at our Burlington location. We offer monthly day and evening sessions.

Other Resources

FREE telephone coaching with someone who helps people quit
QuitWorks: Ask your doctor to refer you to this confidential service. Get information; help making a plan, coaching, and a free two week supply of nicotine patches.
Massachusetts Smokers Helpline: Dial 1-800-QUIT-NOW or 1-800-8-Déjalo (Spanish). The Helpline is free and confidential. Call directly. You can get information, get help making a plan, and get coaching.

Currently Smoking

What types of tobacco use should be included in the pack year smoking history calculation and what are the conversion factors?

Pack year calculators with equivalence for other types tobacco use http://smokingpackyears.com/

Include cigars, pipes, hookahs

Smoking Cessation Resources

American Lung Association

- Toll-free number: 1-800-548-8252

- Website: www.lungusa.org

- Printed quit materials are available, some in Spanish. Also offers a low cost quitsmoking program "Freedom from Smoking Online" at www.ffsonline.org; a free version is available, too

National Cancer Institute

- Free tobacco line: 1-877-448-7848 (1-877-44U-QUIT) (also in Spanish)

- Direct tobacco website: www.smokefree.gov

Smoking Cessation Resources

American Heart Association

- Toll-free number: 1-800-242-8721 (1-800-AHA-USA-1)

- Website: www.americanheart.org

- Quitting tips and advice can be found at www.everydaychoices.org or by calling 1-866-399-6789

Environmental Protection Agency (EPA)

- Telephone: 202-272-0167

- Website: www.epa.gov

- Has advice on how to protect children from secondhand smoke, a Smoke-free Homes Pledge, and other tobacco-related materials on the direct website,

- www.epa.gov/smokefree , or at 1-866-766-5337 (1-866-SMOKE-FREE)

Smoking Cessation Resources

- Be Tobacco Free website https://betobaccofree.hhs.gov/dont-start/index.html

- American Lung Association series of robust resources available nationwide, providing information and resources about quitting available at: http://www.lung.org/stop-smoking/how-to-quit/

- Smoking relapse tips https://www.verywell.com/quit-lessons-smoking-relapse-prevention-2825126

- CDC quit smoking resources https://www.cdc.gov/tobacco/quit_smoking/

- National Quit Line – 1-800-QUIT-NOW

- Smokefree.gov free website https://smokefree.gov/

- BecomeAnEx.org https://www.becomeanex.org/

- TEXT MESSAGING - Sign up for text message reminders and encouragement at http://smokefree.gov/smokefreetxt

- IPHONE AND ANDROID APP - LIVESTRONG My Quit App- free smartphone app that allows you to track your quitting and cravings, and offers encouragement through the quitting process

- Free on-line smoking cessation support group - https://quitnet.meyouhealth.com/#/

- MIndfulness smoking cessation program based on a successful program developed at Yale – web and app based - https://www.cravingtoquit.com/

Smoking Cessation Resources

Centers for Disease Control and Prevention; Office on Smoking and Health

- Free quit support line: 1-800-784-8669 (1-800-QUIT-NOW)

- TTY: 1-800-332-8615

- Website: www.cdc.gov/tobacco

Nicotine Anonymous (NicA)

- Toll-free number: 1-877-879-6422 (1-877-TRY-NICA)

- Website: www.nicotine-anonymous.org

QuitNet

- Website: www.quitnet.com

CTLS Best Practice Alert

Purpose

To alert providers of patients who qualify for a CTLS exam; to assist in early detection of lung cancer

CTLS Best Practice Alert

Criteria

Triggers: Patient…
- Currently smokes or has quit within the last 15 years and is between the ages of 55-77
- Has a pack year history of 30 years or more
- Does not have a lung cancer diagnosis on their Problem List
- Has not had a lung cancer procedure performed

Inclusion Criteria:
- CT Low Dose Lung Screening W/O Contrast – Addison Gilbert/Danvers Only
- CT Lung Screening Request – Burlington/Peabody only

Venue to Launch:
- Opening a patient's chart
- General BPA section

Audience:
- Providers, NPs, PAs and Residents in:
  - Internal and Family Medicine Specialties (All Lahey sites)
  - Primary Care (All Lahey sites)
  - Pulmonology (All Lahey sites)

Lung Screening Questionnaire

Lahey Hospital & Medical Center

Rescue Lung Rescue Life

Revision 13 (5/29/14)

Patient Name:	LC #:	Date:

#	QUESTION	PATIENT RESPONSE	GUIDELINE	RESULT	NEXT STEP
1	How old are you? (Date of birth)		Age 50-74 y	YES	Go to Question 2
				NO	GROUP 3
2	On average how many packs per day have you smoked and for how long?		Using calculator determine pack years and enter result Pack Years (PY) = _____	Age 55-74 & PY ≥ 30	Go to Question 3
				PY < 20	GROUP 3
				Everyone Else	GROUP 2
3	Are you currently smoking? If not have you quit for less than 15 years?		Currently smoking or quit less than 15 years ago.	YES	Go to Question 4
				NO	GROUP 2
4	Have you had a Personal History of Cancer at any time?		Personal History of Lung Cancer within 5 years or Known Metastatic Disease	YES	GROUP 3
				NO	GROUP 1

GROUP 1: Meets Criteria for Free Screening Appt:_____ PCP:_____ (NEW: Y or N) Height_____

1. Schedule appointment, including patients new to Lahey Clinic.   **Loc: BUR LCN Addison Gilbert Danvers**   Weight_____
2. Inform patient they we must receive an order from their PCP to perform the exam. PCPs can fax the order to (781) 744-3634 otherwise the patient must bring the order with them to their appointment. Non-Lahey patients will receive a letter to give to their PCP explaining the program and ordering process. We will ask the patient if they would like the letter mailed to them or emailed to them to bring to their PCP.
3. If the patient does not have a PCP, please instruct patient to call (781) 744-3821 to obtain a PCP.
4. Thank patient for calling and remind patient that, "We want to remind you that this exam is a screening and if you develop any symptoms such as fever, chest pain, new shortness of breath, new or changing cough, coughing up blood, or unexplained significant weight loss you will need to discuss this with your PCP prior to the screening exam".

GROUP 2: May Meet Criteria for Free Screening

Complete the contact information and inform the patient that a member of the clinical team will get back to them within one week to determine eligibility.

Qualified: Y or N   If Yes:_____

GROUP 3: Does Not Meet Criteria for Free Screening

While patient does not meet criteria for free screening they should be encouraged to discuss the role of CT Screening for lung cancer for their situation with their primary care physician.

Outside Films(Chest or Abdomen CT's)

Inform patient that it is important for them to bring prior Chest or Abdomen CT images with them on a CD to be used for comparison.

Does Patient have Outside Images? YES or NO If Yes:_____

Contact Information:

Cell/Home:_____

Would you be interested in participating in a Research Study?
Please circle Yes or No next to each study below:

Yes or No   Georgetown University-Counselor will contact patient

Yes or No   Tissue Sample (Nasal Swab, Mouth Swab, Blood & Urine)

Please ask all callers, "How did you hear of our program?"

Patient Response:

NCCN Lung Cancer Risk Factors for Group 2 Qualification (one required)

1. Family history of lung cancer	2. Personal history of chronic lung disease
O Mother O Sibling O Father O Child	O COPD O Emphysema O Chronic bronchitis O Pulmonary fibrosis

3. Occupational exposure to 10 lung carcinogens

		4. Radon Exposure
O Arsenic	O Chromium	O Documented Residential
O Asbestos	O Diesel Fumes	Occupational
O Beryllium	O Nickel	O Mining
O Cadmium	O Silica	O Firefighter
O Soot	O Coal Smoke	O Military-Active Combat

5. Personal history of cancer (excluding known metastatic disease)

O Lung Cancer (greater than five years ago)	O Colon
O Lymphoma	O Kidney
O Head and neck	O Pancreas
O Esophageal	O Stomach
O Bladder	O Other smoking related cancer
O Cervix	(_____)

Patient Tracking

- Verify eligibility*
- Perform/verify SDM visit; obtain order
- Schedule exam
- Results notification (patient and provider)
- Follow up
  - Incidence scans for negative/benign scans*
  - Interval scans for probably benign scans*
  - Care escalation for suspicious scans*
  - Significant incidental findings*
- Registry reporting
- Missed exams*
- Additional quality metrics
  - Smoking cessation*
  - Diagnosed cancer breakdown*
  - Program volume / active enrollment*

Quality metric measure

Patient Tracking / Follow Up

- Results letter
- Two week phone call
- Itinerary in mail (hospital procedure)
- Phone call two days prior to appointment (hospital procedure)
- <u>If the patient misses their scheduled exam</u>:
  - Reminder letter to patient 30 days after scheduled exam date
  - Reminder letter to patient and PCP 60 days after scheduled exam date
  - Reminder letter to patient and PCP 90 days after scheduled exam date and subsequent discharge from program

- Category 4 and S positive cases → chart review

Results Letters

Left letter (watermark: Negative/Benign):

Lahey Hospital & Medical Center

Rescue Lung Rescue Life

{NAME}
{PTADDRESSBLOCK}

Date: {TODAYSDATE}
Exam: {PROCDESC}
MRN: {MRN}

Dear {NAME},

RE: Your screening low-dose chest CT done on: {EXAMDATE}
Interpreted by: Dr. {INTERPRETEDBY}
Report sent to: {SENTTO}

We are pleased to inform you that your exam showed no signs of lung cancer.

We recommend that your next lung screening exam be on or around: {FOLLOWUPDATE}

Here are some other important points you should know:

• Your full low-dose chest CT report, including any minor observations, has been sent to your health care provider. Your exam report and images will be kept on file at Lahey Hospital & Medical Center as part of your permanent record and are available for your continuing care.

• Although low-dose chest CT is very effective at finding lung cancer early, it cannot find all lung cancers. If you develop any new symptoms such as shortness of breath, chest pain, or coughing up blood, please call your doctor.

• Please keep in mind that good health involves quitting smoking (for help, call Lahey's Quitline at 781-744-QUIT), an annual physical exam, and continued screening with low-dose chest CT.

If you have any questions about this letter or have difficulty in contacting your health care provider please call one of our patient navigators, Christina Bennison at (781) 744-7192 or Shawn Regis at (781) 744-7890.

Sincerely,
The Sophia Gordon Cancer Center and Department of Radiology

Right letter (watermark: Likely Benign):

Lahey Hospital & Medical Center

Rescue Lung Rescue Life

{NAME}
{PTADDRESSBLOCK}

Date: {TODAYSDATE}
Exam: {PROCDESC}
MRN: {MRN}

Dear {NAME},

RE: Your screening low-dose chest CT done on: {EXAMDATE}
Interpreted by: Dr. {INTERPRETEDBY}
Report sent to: {SENTTO}

We are writing to let you know that your recent low-dose lung screening CT shows one or more small and/or stable lung nodules which is likely benign (not cancer). Lung nodules are very common and many people without cancer have these nodules. To make sure this nodule is benign we recommend you have another low-dose chest CT on or around: {FOLLOWUPDATE}

Here are some other important points you should know:

• Your full low-dose chest CT report, including any minor observations, has been sent to your health care provider. Your exam report and images will be kept on file at Lahey Hospital & Medical Center as part of your permanent record and are available for your continuing care.

• Although low-dose chest CT is very effective at finding lung cancer early, it cannot find all lung cancers. If you develop any new symptoms such as shortness of breath, chest pain, or coughing up blood, please call your doctor.

• Please keep in mind that good health involves quitting smoking (for help, call Lahey's Quitline at 781-744-QUIT), an annual physical exam, and continued screening with low-dose chest CT.

If you have any questions about this letter or have difficulty in contacting your health care provider please call one of our patient navigators, Christina Bennison at (781) 744-7192 or Shawn Regis at (781) 744-7890.

Sincerely,
The Sophia Gordon Cancer Center and Department of Radiology

ACR Lung-RADS Suspicious (Category 4)

- No results letter – make sure PCP contacted
- Placed into separate section in database for tracking
- Referred to pulmonary for next steps
- MTOC

Reminder Letters

Patient

Lahey Hospital & Medical Center

Rescue Lung Rescue Life

{NAME}
{PTADDRESSBLOCK}

Date: {TODAYSDATE}

MRN: {MRN}

Dear {NAME},

Our records indicate that you were due for a CT lung screening exam on or around {FOLLOWUPDATE}. Please call 1-781-744-7192 to schedule this appointment. If you have decided you do not want this study performed or you are receiving care elsewhere, please let us know at your earliest convenience so we may update our records.

Here are some other important points you should know:

• Your full low-dose chest CT report, including any minor observations, has been sent to your health care provider. Your exam report and images will be kept on file at Lahey Hospital & Medical Center as part of your permanent record and are available for your continuing care.

• Although low-dose chest CT is very effective at finding lung cancer early, it cannot find all lung cancers. If you develop any new symptoms such as shortness of breath, chest pain, or coughing up blood, please call your doctor.

• Please keep in mind that good health involves quitting smoking (for help, call Lahey's Quitline at 781-744-QUIT), an annual physical exam, and continued screening with low-dose chest CT.

If you have any questions about this letter or have difficulty in contacting your health care provider please call one of our patient navigators, Christina Bennison at (781) 744-7192 or Shawn Regis at (781) 744-7890.

Sincerely,
The Sophia Gordon Cancer Center and Department of Radiology

PCP

Lahey Hospital & Medical Center

Rescue Lung Rescue Life

{REFMD}
{REFMDADDRESSBLOCK}

Date: {TODAYSDATE}

Dear {REFMD},

Our records indicate that your patient {NAME}, MRN: {MRN} was due for a recommended Low Dose Chest CT as part of the Lung Cancer Screening Program on or around {FOLLOWUPDATE}.

We have attempted to reach {NAME} via telephone and mail with no response from the patient. If you have discussed the Low Dose Chest CT with your patient and have decided not to have this study performed or if the patient is receiving care elsewhere, please let us know at your earliest convenience so we can update our records.

If you would like to have your patient schedule an appointment they can call 1-855-CT-CHEST and we will assist them. If you have any questions or need more information please contact one of our patient navigators, Christina Bennison at (781)744-7192 or Shawn Regis at (781)744-7890.

Sincerely,
The Sophia Gordon Cancer Center and Department of Radiology

2018 HPPCS Reimbursement LCS

HCPCS CODE	MODIFIER	SHORT DESCRIPTION	PROC STAT	MAC LOCALITY	NON-FACILITY PRICE	FACILITY PRICE	NON-FACILITY LIMITING CHARGE	FACILITY LIMITING CHARGE	CONV FACT	NA FLAG FOR TRANS NON-FAC PE RVU	NA FLG FOR FULLY IMP NON-FAC PE RVU	NA FLAG FOR TRANS FACILITY PE RVU	NA FLAG FOR FULLY IMP FAC PE RVU	NOT USED FOR MEDICARE	OPPS NON-FACILITY PAYMENT AMOUNT[1]	OPPS FACILITY PAYMENT AMOUNT[1]
G0296		Visit to determ ldct elig	A	0000000	$29.16	$27.00	$31.86	$29.50	35.9996						NA	NA
G0297		Ldct for lung ca screen	A	0000000	$242.28	$242.28	$264.69	NA	35.9996			NA			NA	NA
G0297	26	Ldct for lung ca screen	A	0000000	$52.56	$52.56	$57.42	$57.42	35.9996						NA	NA
G0297	TC	Ldct for lung ca screen	A	0000000	$189.72	$189.72	$207.27	NA	35.9996			NA			NA	NA

https://www.cms.gov/apps/physician-fee-schedule/search/search-results.aspx?Y=0&T=0&HT=1&CT=0&H1=G0296&H2=G0297&M=5

2018 HPPCS Reimbursement LCS

Codes and payment levels for LDCT screening?*			
Description	**Code**	**Professional component**	**Global payment**
Counseling visit to discuss need for screening with LDCT	G0296	$27.00	$27.00
LDCT scan for LCS	G0297	$52.56	$242.26

* Facility Price

Quality Metrics – Histology and Staging
Presumed Lung Cancer Excluded

All Histology	Cases	
NSCLC	118	86.76%
Neuroendocrine	12	8.82%
Unknown	6	4.41%
Total	**136**	

Known NSCLC Histology	Cases	
Adenocarcinoma	84	72.41%
Squamous	31	26.72%
Adenosquamous	1	0.86%
Total	**116**	

	Stage	Cases	
NSCLC	0	3	2.21%
	I	80	58.82%
	II	11	8.09%
	III	12	8.82%
	IV	10	7.35%
Neuroendocrine Tumors	Typical Carcinoid	2	1.47%
	Limited SCLC	6	4.41%
	Extensive SCLC	3	2.21%
Unknown		9	6.62%
Total		**136**	

Known NSCLC Stage	Cases	
0	3	2.59%
I	80	68.97%
II	11	9.48%
III	12	10.34%
IV	10	8.62%
Total	**116**	
Early stage	**94**	**81.03%**
Late stage	**22**	**18.97%**

Surgical Data and Diagnosis
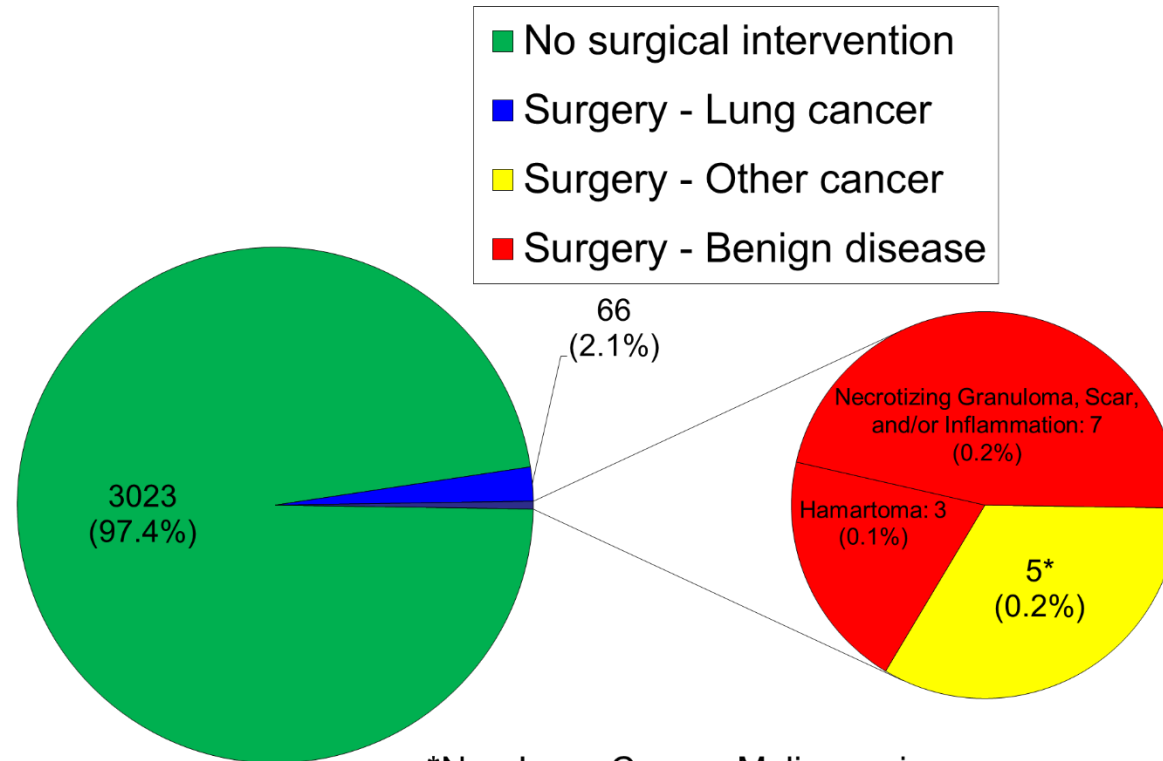
Shared decision making and decision aids
Definition

Shared decision making is a shared **process** of communication and decision making between physician and patient –balances information asymmetry – physician knows medical aspects, patient knows values, lifestyle and treatment preferences

- Available options
- Potential outcomes
- Risks and benefits
- Patient values and preferences
- Reasonable patient standard for information should be shared

  http://jama.jamanetwork.com/article.aspx?articleid=2516469

Decision aid is a tool providing balanced and detailed information about each option giving structure to, and guiding the shared decision making discussion

92

Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: What does it mean? (or it takes at least two to tango). Soc Sci Med. 1997;44(5):681-692. Doi: 10.1016/S0277.9536(96)00221-3.
Alston C, Berger ZD, Brownlee S, et al. Shared decision-making strategies for best care: Patient Decision Aids. Discussion paper, Institute of Medicine. 2014. http://nam.edu/perspectives-2014-shared-decision-making-strategies-for-best-care-patient-decision-aids/
Stacey D, Legare F, Col NF, et al. Decision aids for people facing health treatments or screening decisions. Cochrane Data Base Syst Rev. 2014;1. Doi: 10.10.1002/14651858.CD001431.pub4.

Decision Aid Benefits

- A recent Cochrane update of decision aids concluded that compared to standard care decision aids (DA) resulted in:
  - 13.3% increased knowledge
  - 82% increase in accurate risk perception when DA included probabilities
  - 51% increase in patients choosing an option congruent with values when the DA included an explicit values clarification exercise
  - 7% lower decisional conflict
  - 33% reduction in patients who were passive in decision making
  - 41% reduction in patients who remained undecided after the intervention
  - Positive effect on patient-physician communication
  - 21% reduction in choice major elective surgery
  - 13% reduction PSA testing
  - No differences anxiety, general health outcomes, or condition-specific health outcomes

Stacey D, Legare F, Col NF, et al. Decision aids for people facing health treatments or screening decisions. *Cochrane Data Base Syst Rev.* 2014;1. Doi: 10.10.1002/14651858.CD001431.pub4

Values Clarification

Values clarification exercises are to "help patients clarify and communicate the personal value of options, in order to improve the match between what is most desirable and which option is actually selected."

A systematic review found value clarification exercises may improve the decision making process.

Fagerlin A, Pignone M, Abhyankar P, et al. Clarifying values: an updated review. BMC *Medical Informatics and Decision Making* 2013;13(Suppl 2):S8. doi:10.1186/1472-6947-13-S2-S8.

Resources for Physician SDM Training

AHRQ – The Share Approach

The SHARE Approach

5 Essential Steps of Shared Decision Making

1. **S**eek your patient's participation.

2. **H**elp your patient explore & compare treatment options

3. **A**ssess your patient's values & preferences

4. **R**each a decision with your patient.

5. **E**valuate your patient's decision.

AHRQ's SHARE Approach is a five-step process for shared decision making that includes exploring and comparing the benefits, harms, and risks of each option through meaningful dialogue about what matters most to the patient.

http://www.ahrq.gov/professionals/education/curriculum-tools/shareddecisionmaking/index.html

Resources for Physician SDM Training

Ottawa Hospital Research Institute

On-line tutorial, shared decision making
skills building workshop, inventory of SDM
training programs and links to additional
resources

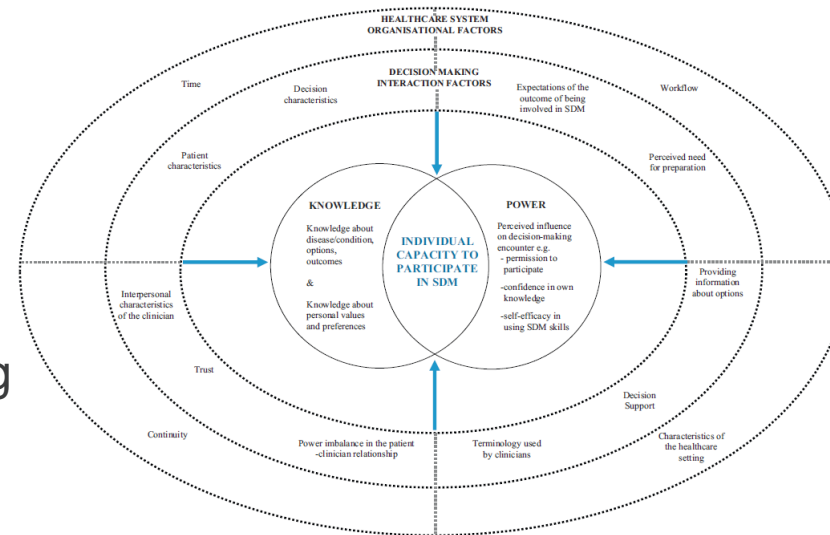https://decisionaid.ohri.ca/training.html

Barriers Shared Decision Making – Patient Perspective

Patients need knowledge AND power

- Knowledge:
  - Disease conditions and outcomes
  - Options
  - Personal values and preferences

- Power:
  - Perceived influence on decision making encounter, e.g. be invited to participate
  - Confidence in own knowledge
  - Self-efficacy in using shared decision-making skills

Joseph-Williams N, Elwyn G, Edwards A. Knowledge is not power for patients: a systematic review and thematic synthesis of patient-reported barriers and facilitators to shared decision making. Patient Educ Couns. 2014 Mar;94(3):291-309. PMID: 24305642

Coordinating the SDM visit and LCS exam
Various approaches are used in clinical practice

- Primary care physician, pulmonologist or their qualified office staff provide SDM during annual health visit and write order for LCS exam

- Nurse practitioner or other qualified healthcare professional provides SDM just prior to scheduled LCS exam at the screening site

- Hybrid -Physician has the option to either provide LCS SDM or refer to qualified healthcare professional at screening site

- EHR systems with pop up notifications and hard stops help identify patients eligible for screening and ensure SDM and smoking cessation counseling provided prior to order for LCS exam

Approaches if limited to 5 minutes for the LCS SDM discussion

Have the patient review a decision aid before physician visit:

- iPad in office
- Video
- Brochure in office or sent to home
- Letter or e-mail with link to on-line decision aid

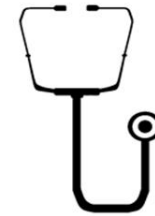Key elements for 5-minute discussion between healthcare professional and patient

- Eligibility criteria
- Potential benefits - individualized
- Potential harms – individualized
- Anxiety, complication and overdiagnosis risk
- Cost
- Commitment – annual not "once and done"
- Smoking Cessation
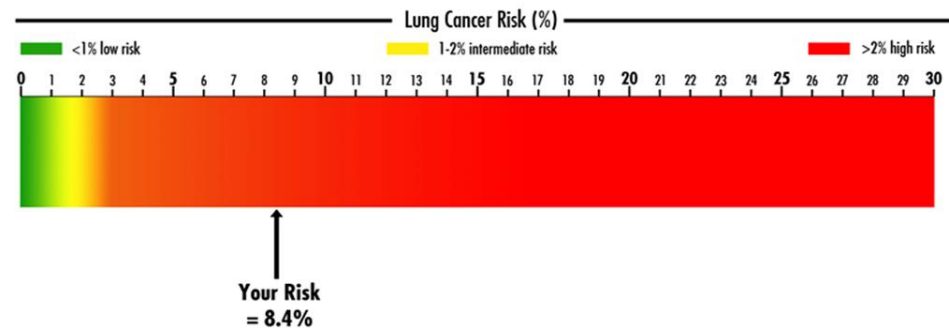
Example lung cancer risk calculator

Individualize and put risk in perspective – high, med, low

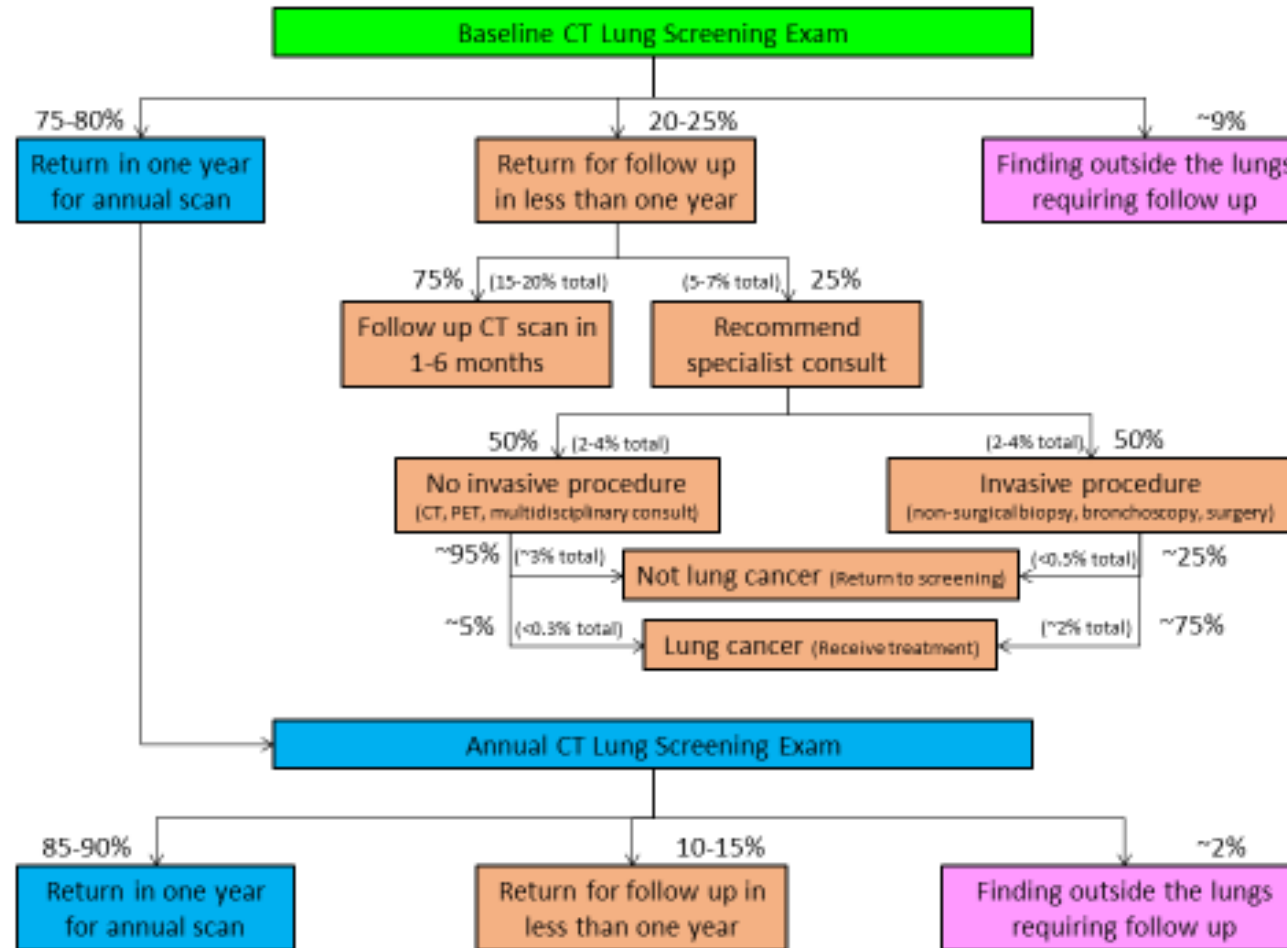http://www.shouldiscreen.com/lung-cancer-risk-calculator-1/

Decision Aid Tools for Clinical Decision Support

Decision Aid	Source	Media	Individualized risk assessment	Criteria for positive scan	Link
Should I Screen	University of Michigan	Web - Interactive	Yes	NLST	http://www.shouldiscreen.com/
LCS with Computerized Tomography (CT)	American Thoracic Society	Print	No	NLST	https://www.thoracic.org/patients/patient-resources/resources/decision-aid-lcs.pdf
Is LCS Right for Me?	Agency for Healthcare Research and Quality	Web & Print. Limited interactive features	No	NLST	https://www.effectivehealthcare.ahrq.gov/index.cfm/tools-and-resources/patient-decision-aids/lung-cancer-screening/patient/
LCS Benefits, harms of chest CT scans	Health Decision	Web – Interactive	Yes	NLST	https://www.healthdecision.org/tool.html#/tool/lungca
Lung Cancer: Should I Have Screening?	Healthwise	Web – Interactive and print	No	NLST	https://www.cigna.com/healthwellness/hw/medical-topics/lung-cancer-abq5042
LCS: Yes or No	Options Grid - Dartmouth Institute	Web interactive and print	No	Lung-RADS™	http://optiongrid.org/option-grids/grid-landing/8
LCS	Center for Clinical Management Research, Ann Arbor VHA	Web- interactive	Yes	NLST	https://lungdecisionprecision.com/
Lung cancer Project	Genentech	Web –Interactive and print	No	NLST & Lung-RADS™	https://www.thelungcancerproject.org/screening
LCS Saves Lives	American Lung Association	Web –Interactive and print	No	?	http://lungcancerscreeningsaveslives.org/

Metrics Achievable in Community Setting
Address Physician Concerns

US CT Lung Screening Timeline

Lahey starts screening program as community benefit – Jan 2012; other sites follow

Increasing number of awareness campaigns for physicians and high risk population - 2016 – present

National Lung Screening Trail
2002 -2010

NLST stopped early 20% reduction mortality demonstrated
November 2010

NLST results published on-line NEJM
June 2011

NCCN Guidelines for screening published
October 2011

USPSTF gives LDCT screening B Grade
December 2013

ACR Registry and LungRADS structured reporting
Fall 2014

CMS starts coverage for LDCT screening
February 2015

Private Insurance & Medicare cover LDCT screening for high risk population
Jan/Feb 2015

By early 2013 many thoracic and cancer societies endorse screening & publish guidelines

ACR Lung cancer designation screening center designation program help ensure sites meet minimum quality requirements for screening - 2015

Knowledge of smoking risks correlated with perceived risk of lung cancer – knowledge assessment questions

Percent of smokers that will get lung cancer

Average years decreased life for smokers

- 0-5
- 6-10
- 11 and higher

One pack/day smoker's risk of developing lung cancer, N(%)

- 0-2X risk
- 5X risk
- 10-20X risk

Park, E.R., Ostroff, J.S., Rakowski, W. et al. Risk perceptions among participants undergoing lung cancer screening: Baseline results from the National Lung Screening Trial. *Ann Behav Med.* 2009; 37: 268. doi:10.1007/s12160-009-9112-9

In NLST African American Former Smokers More Likely to Underestimate Lung Cancer Risk Than Whites

Percent of smokers that will get lung cancer

Average years decreased life for smokers

- 0-5
- 6-10
- 11 and higher

One pack/day smoker's risk of developing lung cancer, N(%)

- 0-2X risk
- 5X risk
- 10-20X risk

Park, E.R., Ostroff, J.S., Rakowski, W. et al. Risk perceptions among participants undergoing lung cancer screening: Baseline results from the National Lung Screening Trial. *Ann Behav Med.* 2009; 37: 268. doi:10.1007/s12160-009-9112-9

TABLE 2: Published DLP to E "k" Conversion Coefficients[a]

| Anatomic Region | DLP to E "k" Conversion Coefficients [mSv / (mGy × cm)] | | | | Phantom (cm) |
	Jessen et al., [11] (1999)	EC [12] (2000)	EC Appendix B [10] (2004)	EC Appendix C [13] (2004) and NRPB-W67 [14] (2005)	
Head	0.0021	0.0023	0.0023	0.0021	16
Head and neck				0.0031	16
Neck	0.0048	0.0054		0.0059	32
Chest	0.014	0.017	0.018	0.014	32
Abdomen	0.012	0.015	0.017	0.015	32
Pelvis	0.019	0.019	0.017	0.015	32
Chest, abdomen, and pelvis				0.015	32

Note—EC = European Commission, NRPB = National Radiological Protection Board.
[a]$E = k \times DLP$, where DLP = dose–length product. The phantom size is specified for the volume CT dose index measurements on which DLP is based.

Lahey CTLS exams 1/1/2016 – 12/31/2017

- DLP = 46.45 mGy-cm
- E = DLP * k
- E = 46.45 * 0.014
- **E = 0.65 mSv**

Example patient:

- Group 2
- In program for all years eligible (age 50-80; 30 years)
- **THREE** screening exams a year
- **58.5 mSv**

Radiation workers – 50mSV per year

Additional CMS Requirements for Lung Cancer Screening

For the initial LDCT lung cancer screening service: a beneficiary must receive a written order for LDCT lung cancer screening during a lung cancer screening counseling and shared decision making visit, furnished by a physician (as defined in Section 1861(r)(1) of the Social Security Act) or qualified non-physician practitioner (meaning a physician assistant, nurse practitioner, or clinical nurse specialist as defined in § 1861(aa)(5) of the Social Security Act).

For subsequent LDCT lung cancer screenings: the beneficiary must receive a written order for LDCT lung cancer screening, which may be furnished during any appropriate visit with a physician (as defined in Section 1861(r)(1) of the Social Security Act) or qualified non-physician practitioner (meaning a physician assistant, nurse practitioner, or clinical nurse specialist as defined in Section 1861(aa)(5) of the Social Security Act). If a physician or qualified non-physician practitioner elects to provide a lung cancer screening counseling and shared decision making visit for subsequent lung cancer screenings with LDCT, the visit must meet the criteria for a counseling and shared decision making visit.

Written orders for both initial and subsequent LDCT lung cancer screenings must contain the following information, which must also be appropriately documented in the beneficiary's medical records:

    Beneficiary date of birth;
    Actual pack - year smoking history (number);
    Current smoking status, and for former smokers, the number of years since quitting smoking;
    Statement that the beneficiary is asymptomatic (no signs or symptoms of lung cancer); and
    National Provider Identifier (NPI) of the ordering practitioner.