



# Barriers To Lung Cancer Screening

Janaki Deepak MBBS, FACP  
Associate Professor of Medicine  
Director Lung Cancer Screening and  
Tobacco Health & Treatment  
University Of Maryland School Of Medicine  
Director, Lung Mass Clinic, Baltimore VA Medical Center



## Disclosure of Financial Relationships

- None



**Breathing clean air, saving the planet issue**  
ID [94802535](#) © [Lyoshanazarenko](#) | [Dreamstime.com](#)



# Objectives

- **Describe barriers to lung cancer screening (LCS) from the patient's perspective**
- **Describe barriers to LCS from the referring provider's perspective**
- **Identify potential solutions to current barriers to LCS**



**Organizational LCS Eligibility Recommendations**

	Year	Age	Pack-Years	Quit	Other
<b>AAFP<sup>1</sup></b>	2013	Ins. Ev.	Ins. Ev.	Ins. Ev.	None
<b>AATS Tier 1<sup>2</sup></b>	2012	55 - 79	≥ 30	No Limit	None
<b>AATS Tier 2<sup>2</sup></b>	2012	50-79	Over 20	No Limit	Cumulative 5% chance of developing lung cancer in next 5 years
<b>AATS Tier 3<sup>2</sup></b>	2012	Any	Any or None	No Limit	Personal History of Lung Cancer and 4 years NED
<b>ACS<sup>3</sup></b>	2013	Over 50	≥ 30	≤ 15	"Relatively good health"
<b>ACCP<sup>4</sup></b>	2017	55 - 77	≥ 30	≤ 15	None
<b>ALA<sup>5</sup></b>	2017	55 - 80	≥ 30	≤ 15*	None
<b>ASCO/ATS<sup>6</sup></b>	2015	55-74	≥ 30	≤ 15	None
<b>CMS<sup>9</sup></b>	2015	55 - 77	≥ 30	≤ 15	None
<b>NCCN Group 1<sup>7</sup></b>	2017	55 - 74	≥ 30	≤ 15	None
<b>NCCN Group 2<sup>7</sup></b>	2017	Over 50	Over 20	No Limit	At least one additional lung cancer risk factor or at least 1.3% chance of lung cancer diagnosis within 6 years
<b>USPSTF<sup>8</sup></b>	2014	55 - 80	≥ 30	≤ 15	None

\*\*\*\*\*

AAFP = American Association of Family Physicians, AATS = American Association of Thoracic Surgery, ACS = American Cancer Society, ACCP = American College of Chest Physicians, ASCO = American Society of Clinical Oncology, ATS = American Thoracic Society, ALA = American Lung Association, CCO = Cancer Care Ontario, NCCN = National Comprehensive Cancer Network, USPSTF = United States Preventive Services Task Force, CMS = Center for Medicare and Medicaid Services

Year = year recommendation was published, Ins. Ev. = insufficient evidence to recommend for or against screening

Other = additional considerations for groups to screen beyond the core recommendation:

ALA – urges consideration of risk prediction, suggests standard criteria given insurance coverage, \* = not forced to exit screening after reaching 15 year quit mark



JAMA | US Preventive Services Task Force | **RECOMMENDATION STATEMENT**

## Screening for Lung Cancer

### US Preventive Services Task Force Recommendation Statement

US Preventive Services Task Force

\*\*\*\*\*

Adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years

The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

B



# Cancer Screening Rates

- Adherence to repeat lung cancer screening reported from other academic centers for LDCT with Lung-RADS 1 or 2 is 28% to 38%
- Adherence to guideline-recommended screening for breast and colorectal cancer screening is 76% to 81% and 59% to 65%,



## *Who Is Offered Lung Cancer Screening*

- Adults
  - 50 to 80 years
  - 20 pack-year smoking history
  - currently smoke or have quit within the past 15 years.
- Screening may not be appropriate for patients with substantial comorbid conditions, particularly those who are in the upper end of the screening age range.

# Lung cancer screening saves lives. So why do so few of those at risk get one?

*A new study finds less than 6% of those eligible get lung cancer screenings. Experts point to complicated guidelines, a lack of awareness and wary patients.*



**Karen Weintraub**

USA TODAY

Published 5:00 a.m. ET Nov. 15, 2022 | Updated 5:20 p.m. ET Nov. 15, 2022

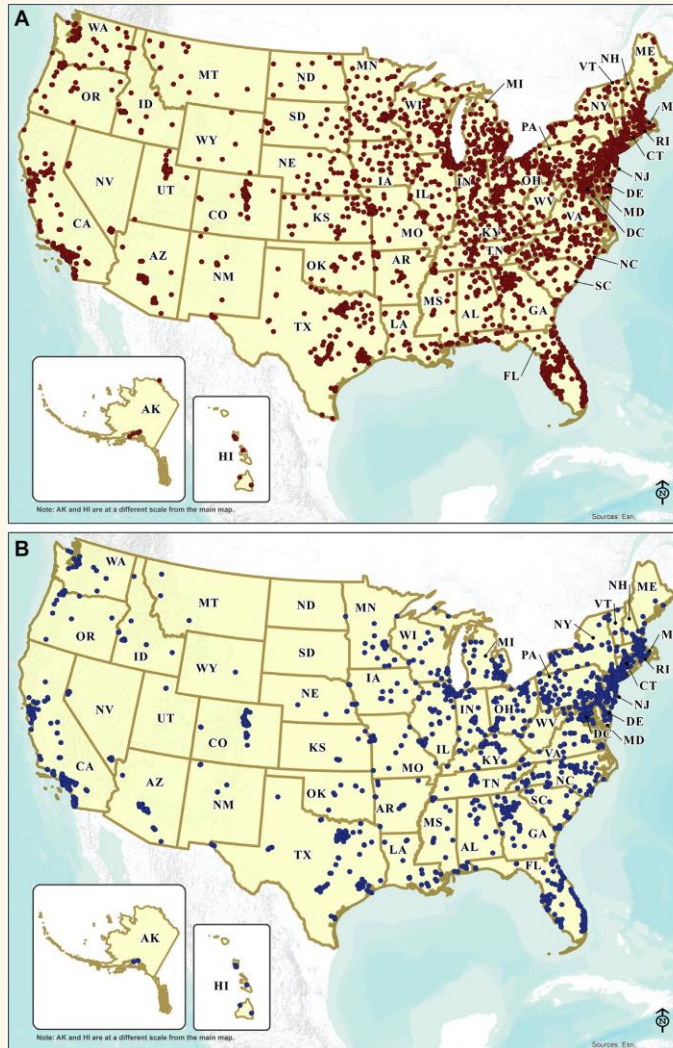




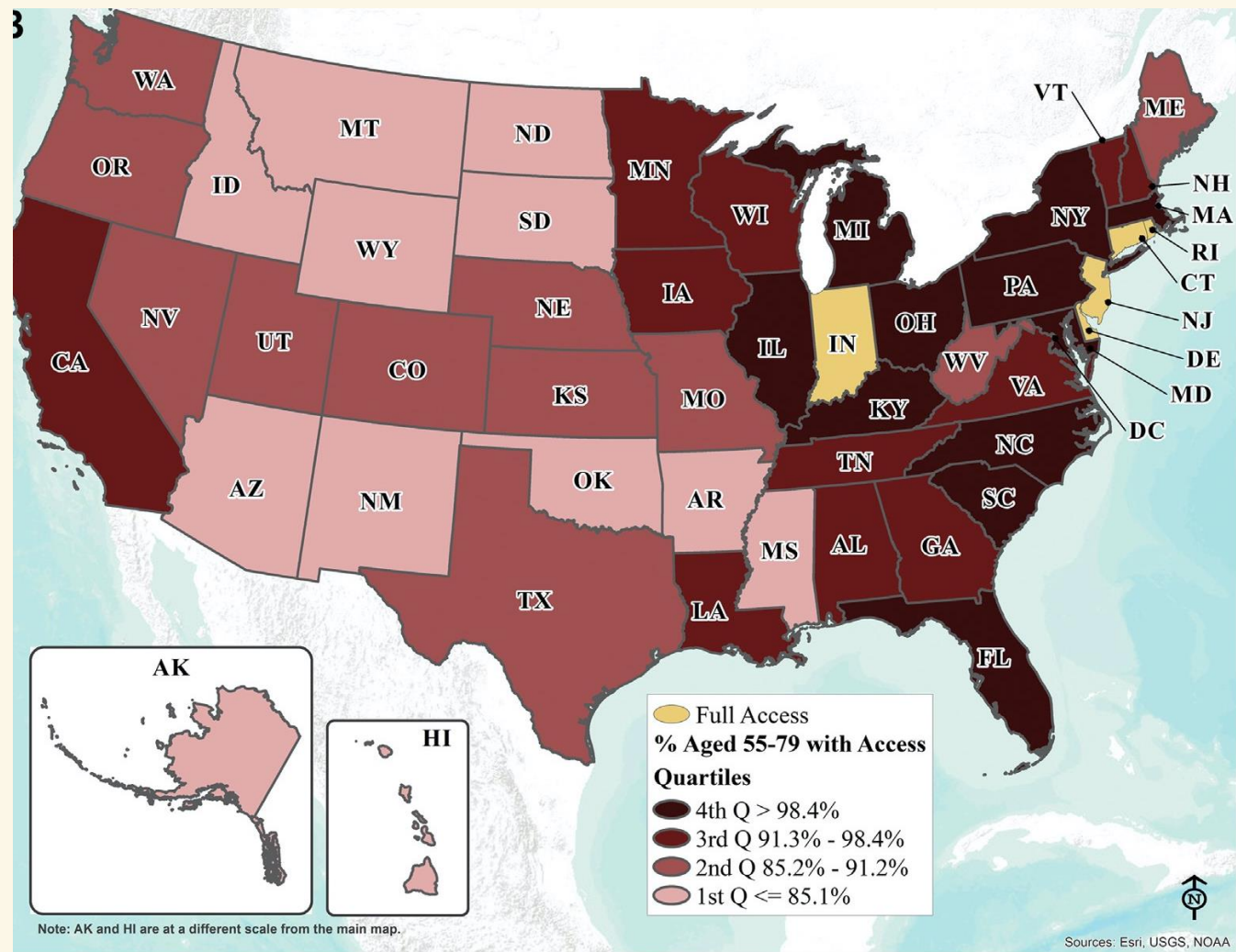
# Barriers To LCS Patient's Perspective

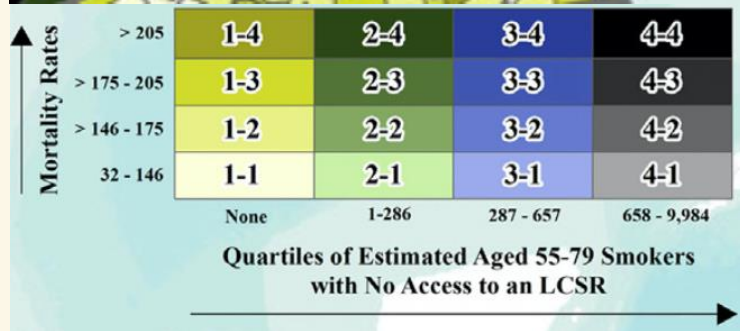
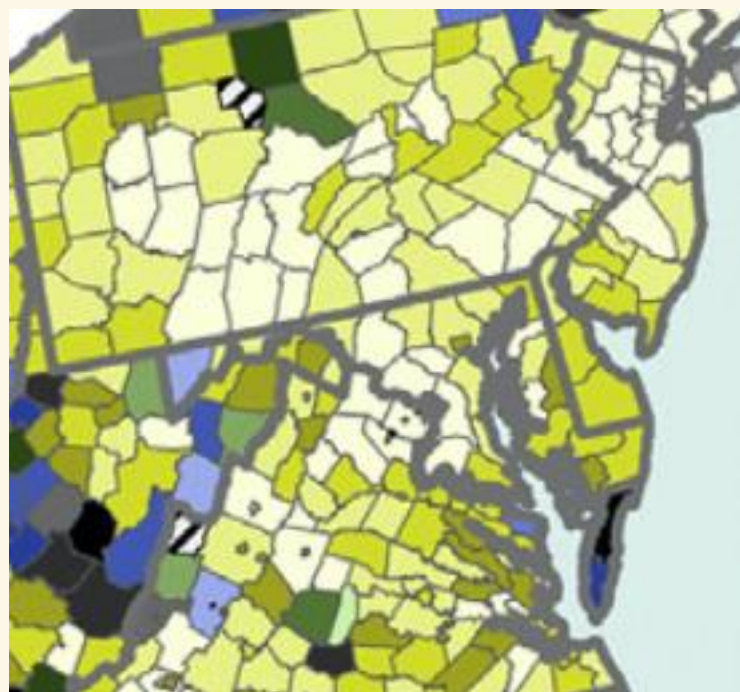
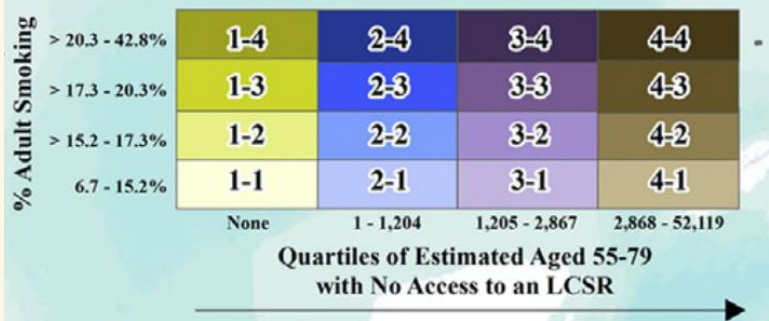
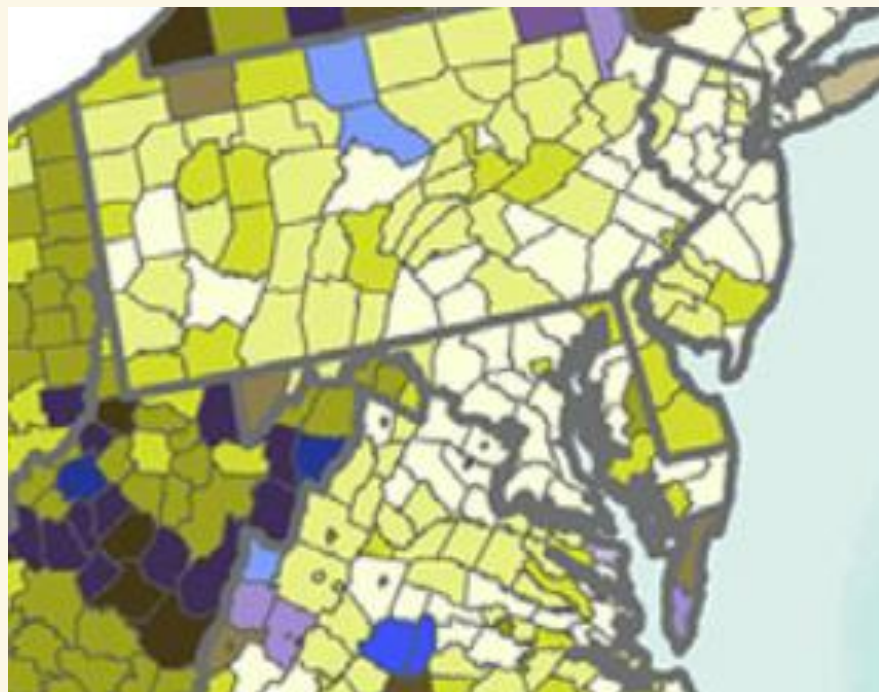


# ACCESS TO LCS



A, B, Lung cancer screening facilities nationwide. A, ACR LCSC facilities. B, ACR LCSC facilities. ACR American College of Radiology; LCSC Lung Cancer Screening Center; LCSC lung cancer screening registry.







## Follow Up

- Appropriate follow-up is essential to achieve LCS mortality benefits
- More than one-half of all screen-detected cancers in both the National Lung Screening Trial (NLST) and the Dutch-Belgian Lung Cancer Screening Trial (NELSON) were detected on subsequent rounds of screening

1. de Koning HJ, van der Aalst CM, de Jong PA, et al. Reduced lung-cancer mortality with volume CT screening in a randomized trial. *N Engl J Med.* 2020;382(6):503-513.

2. National Lung Screening Trial Research Team, Aberle DR, Adams AM, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med.* 2011;365(5):395-409.

3. Krist AH, Davidson KW, Mangione CM, et al. Screening for lung cancer: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2021;325(10):962-970.

- Patients Who Have Undergone Screening Report Positive and Easy Experiences With Screening and Positive Attitudes Toward Screening

- “I think it’s pretty easy right now if you want to do it”
- “It was not a hardship, it was an easy thing to do”
- “Everything was orderly when I arrived, it was quick to get in, the screening was comfortable”
- “It’s not invasive, and it’s not embarrassing, it’s not...people are not demanding, so it’s a good experience”
- “If you [are] high risk I think it’s very important”
- “I’m going to have them as long as the doctor wants me to have them, so I’m game you know what I mean”
- “I think based on my history more screening would be advantageous in providing me with the knowledge of any problems just like I go in for a colonoscopy”

- Provider recommendation is a near-universal motivator for screening and the key facilitator for most patients

- "If my health care provider recommends it I certainly will comply"
- "I don't think I knew it could be done until someone, until the primary care suggested it"
- "I follow my doctor's recommendations mostly"
- "If my doctor thinks it's necessary I'll do it"
- "If my health care provider ask me to do it, then I will do it, otherwise I cannot think of anything because I cannot see anything wrong with me"
- "Not without insistence from my doctor"



- Although patients understand lung cancer risk factors, many are influenced by personal factors and symptoms rather than understanding the importance of asymptomatic screening

- “My family was in the body and fender business and...I breathed a whole lot of stuff, so my whole life I’ve been breathing a whole lot of stuff that I shouldn’t have been breathing, and then to top it off, I smoke cigarettes”
- “I think that the older I get, the higher the risk of cancer”
- “If I had lung cancer I’d have a symptom, ok, of some sort and so I guess that’s where my head has been at”
- “For a smoking person like me I think it’s less important given that the results should be obvious and recognizable, the screening for things like colon cancer and breast cancer and mammography seem to not be so evident and obvious, the kind of hidden and creeping issues that could benefit from a screening”
- “If I had maybe a cough or something that might indicate that there was a problem”

- Concerns over cost, insurance coverage, screening accessibility, and other medical conditions are often cited as barriers to longitudinal screening

- “The primary thing was first of all I needed to know that it was going to be covered by the insurance because if it wasn’t I couldn’t have afforded it”

- “After getting them for two to three years, my insurance said I didn’t need them any longer and they would not pay for them”

- “Other than the travel logistics it was easy, traveling there and then returning home was a logistics problem because of not having a car and a local city construction work”

- “My problem is transportation, getting to [facility], no no no I’m dead serious about this, I’ve had appointments and I can’t get there, I don’t drive, I have no support system”

- “To have them done locally would be amazing”

- “Have more places that you can have it done”

- Other health concerns can make screening less of a priority

- “I was going to schedule the follow up and then came the virus... so I don’t, I’m not, I’m just staying away from all medical care places”
- “I actually wanted to get this last screening about a month ago, it was, I had an appointment, and like I said I didn’t keep it because of the coronavirus going around”
- “Yes I would have been due for one I believe this last summer, however just as I was going to be due for that I was diagnosed with breast cancer, it’s ok, but you know that diagnosis took over everything, so I put off the lung cancer screening, it’s still in my mind that I would like to have a follow up”

- Patients have variable preferences about how they should receive their screening results, and many have residual questions about their results and future screening

- “It would have been nice just to have a phone call, just for reassurance purposes”
- “The results were good so I was good with the letter, if they hadn’t been good I would probably would have preferred a phone call”
- “No that was fine, the results were negative and it was easy to understand, there was a number that I could call if I needed additional help”
- “I think the way we get the results the reason was pretty fast, very prompt, so I’m very satisfied with the way it was done”
- “I think to me I’d like a little more clarity on what the frequency should be, that’s not clear to me right now”
- “I don’t recall what they looked for or what they found and what I should be doing in the future, so I’m in the dark and I don’t know if that’s because I don’t remember or they didn’t tell me, or I’m just lost in the information on that”
- “I didn’t know that I should return for a second test”

- “It would have been nice to have a real drill down explanation of CT scan, what it’s looking for, what it’s not going to find, risk involved with having CT scans every year, that kind of thing so I think that the prep when I first started and it wouldn’t be a bad thing to have it now to be honest, would be that they give you as much information about it before you go into it, because I don’t really have a good understanding of the down sides”

- “If they tell me I need one then I’ll more than likely go and get one”
- “If I can get them to you know, drop me reminders, yeah you betcha, you know I will”
- “When it gets close to a year that I should be notified and appointment should be set to do it again, without me having to do it”

- Reminders, in various formats, are an important facilitator of annual screening

- Most patients think a navigator would be beneficial to the screening process, with patients reporting differences in which aspects of navigation would be most helpful to them

- “It would be kind of nice to have just one person to set you up and tells you what the results are and tells you when you need to come back”
- “What I need to have is somebody who says what time would be convenient for you and do you have any transportation issues”
- “I think that you know patients that have other problems or other barriers, whether it’s language, transportation, lack of health care coverage, that kind of thing, a person like that could be a huge help”
- “If they could be a liaison with the ordering physician, so that if there was something they could make sure that they were aware of it and got in contact with the patient”



- Misconceptions about asymptomatic screening were more prevalent among nonadherent participants
  - “You know the doctor did tell me that sometimes when you go through these screenings that the information isn’t always 100% accurate, that sometimes it might be polyps or whatever they call them, that are just normal and everything, but it ends up being, ok now you need to do this and you need to do that, so if there’s no issues, I’m not going to do it”
- Adherent participants
  - more likely to have received specific recommendation to continue with annual screening and demonstrate understanding of screening recommendations
  - more likely to have reviewed their results with their provider in person or over the phone



# Barriers To LCS Providers Perspective





Barriers to screening	Attending Physicians		Resident Physicians		p-value <sup>a</sup>
	N	%	N	%	
	Any barrier	37	88.1	28	
Cost to patient <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">1</span>	31	72.8	25	83.3	0.338
Too many false positives	28	66.7	22	73.3	0.545
Potential for emotional harm	23	54.8	19	63.3	0.467
Potential for complications	22	52.4	21	70.0	0.133
Cost to healthcare system	19	45.2	20	66.7	0.072
Lack of efficacy/evidence	16	38.1	12	40.0	0.870
Low patient acceptance	14	33.3	13	43.3	0.388
False negatives/missed cancers	2	4.8	4	13.3	0.227



Attitude statement	Attending Physician		Resident Physician		p-value <sup>a</sup>
	N=42		N=30		
	N	%*	N	%*	
<b>I am convinced that screening for lung cancer is beneficial for patients</b>					
Strongly agree	3	7.5	1	3.5	0.709
Agree	13	32.5	9	31.0	
Undecided	17	42.5	16	55.2	
Disagree	7	17.5	3	10.3	
Strongly disagree	0	0	0	0	
Missing	2	-	1	-	
<b>Inconsistent recommendations about lung cancer screening make it difficult to decide whether or not to screen</b>					
Strongly agree	5	12.2	3	10.3	0.620
Agree	18	43.9	16	55.2	
Undecided	3	7.3	4	13.8	
Disagree	13	31.7	5	17.2	
Strongly disagree	2	4.9	1	3.5	
Missing	1	-	1	-	
<b>Screening for lung cancer is cost-effective</b>					
Strongly agree	1	2.4	0	0	0.687
Agree	7	17.1	2	6.9	
Undecided	22	53.7	19	65.5	
Disagree	6	14.6	5	17.2	
Strongly disagree	5	12.3	3	10.3	
Missing	1	-	1	-	
<b>I rely on the recommendations of local specialists regarding lung cancer screening in my practice</b>					
Strongly agree	0	0	0	0	0.173
Agree	9	22.5	7	24.1	
Undecided	6	15.0	6	20.7	
Disagree	19	47.5	16	55.2	
Strongly disagree	6	15.0	0	0	
Missing	2	-	1	-	

Attitude statement	Attending Physician		Resident Physician		p-value <sup>a</sup>
	N=42		N=30		
	N	%*	N	%*	
<b>I have enough knowledge to explain the pros and cons of lung cancer screening to my patients</b>					
Strongly agree	8	20.0	1	3.5	0.156
Agree	16	40.0	17	58.6	
Undecided	8	20.0	4	13.8	
Disagree	7	17.5	7	24.1	
Strongly disagree	1	2.5	0	0	
Missing	2	-	1	-	
<b>Time restrictions during a patient's clinical visit mean other presenting problems have higher priority than screening for lung cancer</b>					
Strongly agree	6	15.4	4	13.8	0.323
Agree	18	46.2	18	62.1	
Undecided	4	10.3	4	13.8	
Disagree	11	28.2	3	10.3	
Strongly disagree	0	0	0	0	
Missing	3	-	1	-	

Henderson LM, Jones LM, Marsh MW, Brenner AT, Goldstein AO, Benefield TS, Greenwood-Hickman MA, Molina PL, Rivera MP, Reuland DS. Opinions, practice patterns, and perceived barriers to lung cancer screening among attending and resident primary care physicians. Risk Manag Healthc Policy. 2018 Jan 22;10:189-195. doi: 10.2147/RMHP.S143152. PMID: 29403320; PMCID: PMC5784747.

# Systems Barriers

	Initial LDCT	Subsequent LDCT
Result	N (%)	N (%)
<b>Negative (Lung-RADS 1)</b>		
Total	1285	415
LDCT	339 (26.4)	179 (43.1)
Chest CT	24 (1.9)	10 (2.4)
No follow-up	922 (71.8)	226 (54.4)
<b>Benign appearance (Lung-RADS 2)</b>		
Total	607	294
LDCT	194 (31.9)	139 (47.3)
Chest CT	26 (4.3)	13 (4.4)
No follow-up	387 (63.8)	142 (48.3)
<b>Short-interval follow-up (Lung-RADS 3)</b>		
Total	197	50
LDCT	68 (34.5)	19 (38.0)
Chest CT	33 (16.8)	8 (16.0)
No follow-up	96 (48.8)	23 (46.0)

Wernli KJ, Tuzzio L, Brush S, Ehrlich K, Gao H, Anderson ML, Palazzo L. Understanding Patient and Clinical Stakeholder Perspectives to Improve Adherence to Lung Cancer Screening. Perm J. 2021 Jun 2;25:20.295. doi: 10.7812/TPP/20.295. PMID: 35348073; PMCID: PMC8817936.

# Themes from key informant interviews with organizational and clinical leaders

Theme	Description
1. Clarifying roles and responsibilities regarding LDCT	There is uncertainty about the boundary of responsibility for primary care provider vs others (radiologists, pulmonologists, etc). The lack of a clear boundary of roles and responsibilities creates an opportunity for patients to “fall through the cracks.”
2. Enhancing care coordination across primary care, specialty care, and ancillary services	Preventive care should be unified in mission and values across primary and specialty care. Adherence to lung cancer screening needs to be a shared responsibility, with clear handoffs and leveraging of the strengths of all health-care systems partners.
3. Improving training of clinicians and care teams in lung cancer screening	Clinicians have limited opportunities to learn about lung cancer screening and normalize the process in routine care. Ongoing training needs to include all team members, including medical assistants.
4. Automating EHR tools to ease clinician burden and simplify processes	Current EHR tools are inadequate to meet clinicians needs to remind them when patients are due for screening and to facilitate ordering of next LDCT. Clinicians lack a health maintenance reminder.
5. Creating data metrics to support benchmarking	Metrics from clinical leadership are based on the provider’s panel (eg, how many Pap smears the provider needs to do from their panel), and lung cancer screening is not included in these panels.
	This is something that is missing from the message about delivering high-quality care.

- Wernli KJ, Tuzzio L, Brush S, Ehrlich K, Gao H, Anderson ML, Palazzo L. Understanding Patient and Clinical Stakeholder Perspectives to Improve Adherence to Lung Cancer Screening. Perm J. 2021 Jun 2;25:20.295. doi: 10.7812/TPP/20.295. PMID: 35348073; PMCID: PMC8817936.



## Improve screening adherence

Themes	Example solutions
1. Offer reminders for scheduling and appointments	•Send text message reminders
	•Offer reminder phone calls; person calling should also be able to schedule
	•Make follow-up scheduling easy—for example, return every x months (when due), instead of telling people different time periods
2. Increase patients' knowledge about tests and follow-up	•Information on screening and recommended rescreen intervals
	•Screening risks and benefits
	•Expectations of what screening tests involve and how to interpret what results mean
3. Improve convenience in location and scheduling	•Have LDCT available at all KP care centers
	•Make LDCT available in the doctor's office at time of yearly checkup
	•Make LDCT available in mobile vans like they do for blood banks
4. Provide financial and nonfinancial incentives for completing follow-up LDCT	•Offer scanning machine at the mall/grocery store
	•Reimburse patients for gas to travel to get the LDCT
	•Offer a discount on insurance if LDCT is completed
	•Offer a reasonable/no-cost option to have follow-up testing
	•Give a gift or present if patients do the test ("I gave blood" sticker)
	•Make getting test fun
	•Offer a "refer-a-friend" program



# What Happens In Federally Qualified Clinics ?

Domain	Site A	Site B
Implementation process	<p>Facilitators:</p> <ul style="list-style-type: none"> <li>• Slow, stepwise approach working through challenges with individual payer groups</li> <li>• Delay rollout to health care providers until after initial challenges resolved</li> </ul> <p>Barrier:</p> <ul style="list-style-type: none"> <li>• Lengthy process</li> </ul>	<p>Barriers:</p> <ul style="list-style-type: none"> <li>• Rapid rollout leads to numerous implementation challenges simultaneously</li> <li>• Minimal communication of lessons learned when expanding to additional clinic sites</li> </ul>
FQHC context	<p>Facilitators:</p> <ul style="list-style-type: none"> <li>• On-site breathing center and high level of knowledge of lung disease</li> <li>• EHR customizable to track pack-years and issue health care provider reminders for lung cancer screening</li> </ul>	<p>Barriers:</p> <ul style="list-style-type: none"> <li>• Competing priorities such as patient-centered medical home accreditation and EHR change</li> <li>• Unable to modify EHR to track pack-years or issue reminders for lung cancer screening</li> </ul>
Staff member engagement	<p>Facilitators:</p> <ul style="list-style-type: none"> <li>• Leadership buy-in and support</li> <li>• Enthusiastic project champion who conducted internal pilot and provider education</li> </ul> <p>Barrier:</p> <ul style="list-style-type: none"> <li>• Health care provider concerns about false-positive test results</li> </ul>	<p>Facilitator:</p> <ul style="list-style-type: none"> <li>• Strong champion support at project outset</li> </ul> <p>Barriers:</p> <ul style="list-style-type: none"> <li>• Low buy-in from leadership</li> <li>• Project champion left FQHC</li> <li>• Substantial staff turnover</li> </ul>
Partner relations	<p>Facilitator:</p> <ul style="list-style-type: none"> <li>• Regular meetings to proactively address challenges</li> </ul>	<p>Barriers:</p> <ul style="list-style-type: none"> <li>• Inconsistent meeting schedule</li> <li>• Tense relationship after screening partner halted project temporarily</li> </ul>

Watson L, Cotter MM, Shafer S, Neloms K, Smith RA, Sharpe K. Implementation of a Lung Cancer Screening Program in Two Federally Qualified Health Centers. Public Health Rep. 2021 Jul-Aug;136(4):397-402. doi: 10.1177/0033354920971717. Epub 2021 Jan 13. PMID: 33440129; PMCID: PMC8203035.



# Racial Differences In Barriers

- Centralized academic based LCS





HINTS Question	Jefferson Survey Cohort (n = 269)			HINTS 5, Cycles 1 & 2 Cohort (n = 2235) Weighted Distribution (95% CI)		
	African-American Individuals	White Individuals	P Value	African-American Individuals	White Individuals	P Value
It seems like everything causes cancer.	69.0%	53.2%	0.012	73.2% (65.2-79.4)	69.5% (65.0-72.8)	.250
There's not much you can do to lower your chances of getting cancer.	39.2%	21.9%	0.003	36.0% (27.9-45.1)	22.3% (19.5-25.4)	.004
When I think of cancer, I automatically think of death.	74.5%	65.6%	0.135	65.4% (57.5-72.5)	61.3% (57.5-72.5)	.278
There are so many recommendations about preventing cancer it's hard to know which ones to follow.	61.0%	49.1%	0.061	73.9% (67.0-79.7)	74.2% (70.6-77.6)	.926

Risk Perceptions	African-American Individuals	White Individuals	P Value
<b>Has a doctor or other health professional ever told you that you are at high risk for lung cancer?</b> (n=258)			.894
Yes	48 (49.0%)	77 (48.1%)	
No	50 (51.0%)	83 (51.9%)	
<b>Do you think that you are at risk for lung cancer?</b> (n = 254)			.305
Yes	70 (74.5%)	128 (80%)	
No	24 (25.5%)	32 (20.0%)	
<b>Lerman Cancer Worry Scale* (n = 258)</b>	<b>African-American Individuals</b>	<b>White Individuals</b>	<b>P Value</b>
How much do you currently worry about getting lung cancer someday?	6.10 ± 3.66	4.66 ± 3.16	<.001
How much do your worries about lung cancer impact your <b>mood</b> ?			
How much do your worries about lung cancer impact your <b>daily activities</b> ?*			
* Cronbach alpha = 0.79 (n = 3 questions), range 0-13			
<b>Decision barriers</b>	<b>African-American Individuals</b>	<b>White Individuals</b>	<b>P Value</b>
<b>Factors reported as "Very Important" in making the decision to undergo lung cancer screening</b>			
Cost (n = 265)	59 (58.4%)	62 (37.8%)	.001
Convenience (n = 264)	60 (60.0%)	44 (26.8%)	<.001
Risk of disease (n = 263)	62 (61.4%)	73 (45.1%)	.01
Test accuracy (n = 263)	77 (77.0%)	113 (69.3%)	.177



	<b>Unadjusted OR (95% CI)</b>	<b>Adjusted OR (95% CI)</b>
<b>Age</b>	1.04 (0.99-1.09) <sup>+</sup>	1.02 (0.96-1.08)
<b>Race</b>		
Whites	1.00	N/A
African-American (AA)	0.96 (0.59-1.58)	
<b>Gender</b>		
Males	1.00	1.00
Females	0.92 (0.55-1.52)	0.91 (0.53-1.55)
<b>Education</b>		
≤High school (HS) diploma	1.00	N/A
>HS diploma	1.87 (1.15-3.06)*	
<b>Smoking status</b>		
Former	1.69 (1.04-2.76)*	1.58 (0.93-2.67) <sup>+</sup>
Current	1.00	1.00
<b>Insurance status</b>		
Medicaid/ Dual eligible	1.00	1.00
Medicare	3.06 (1.53-6.11)*	2.23 (1.03-4.84)*
Private/ Other	1.78 (0.90-3.53) <sup>+</sup>	1.64 (0.78-3.45)
<b>Race x Education</b>		
White x ≤HS	1.00	1.00
White x >HS	1.46 (0.78-2.74)	1.31 (0.69-2.51)
AA x ≤HS	0.87 (0.42-1.79)	0.97 (0.45-2.08)
AA x >HS	2.05 (0.96-4.40) <sup>+</sup>	2.42 (1.09-5.37)*



# Inadequacy Of Focus On Tobacco Treatment –Another Potential Barrier



## Effect of Smoking Cessation on Overall Health and Lung Cancer Risk Among Smokers

- Smokers between ages 55 and 64 years may gain 4 years of life by quitting smoking (N Engl J Med. 2013; 368:341–350. [PubMed: 23343063] )
- 5-year survival rate for patients aged 65 years with early stage non small cell lung cancer who quit smoking is 70% compared with 33% among those who continue smoking (BMJ. 2010; 340:b5569. [PubMed: 20093278] )
- Combination of smoking abstinence (15 years) and LDCT screening, resulted in a 38% reduction in lung cancer–specific mortality (HR, 0.62; 95% confidence interval, 0.51–0.76) (Am J Respir Crit Care Med. 2016 Mar 1;193(5):534–41. doi: 10.1164/rccm.201507-1420OC. PMID: 26502000)



## Effect of Lung Cancer Screening on Smoking Behavior

- LDCT scan screening itself does not influence smoking behavior; however, the reporting of positive results may be associated with increased smoking abstinence
- 77% of NLST participants continued to smoke after three rounds of screening
- Among current smokers in the Dutch-Belgian NELSON Lung Cancer Screening Trial, 41% reported no intention to quit smoking, vs. 13% in the NLST
- In the Danish Lung Cancer Trial (N = 4104), there was no effect of lung cancer screening on smoking

Two-Year Follow-Up of a Randomized Controlled Study of Integrated Smoking Cessation in a Lung Cancer Screening Program. *JTO Clin Res Rep.* 2020 Sep 15;2(2):100097. PMID: 34589978; PMCID: PMC8474430.  
*Thorax.* 2010; 65:600–605. [PubMed: 20627916]  
*Thorax.* 2014; 69:574–579. [PubMed: 24443174]



- NSLT participants who were current smokers at the time of enrollment had over a 2-fold increased lung cancer mortality during follow up compared to former smokers, regardless of their screening arm
- Former smokers in the LDCT arm of NLST (7 years) had a 20% mortality reduction
- Former smokers in the chest radiography screening arm who remained abstinent for 7 years had a 20% mortality reduction compared to current smokers--the same magnitude of benefit achieved with LDCT screening.
- **Patients who received more intensive smoking-cessation interventions In the NLST trial year 1 from their primary care provider had higher smoking quit rates than patients who received less intensive interventions (ie, asked about smoking, advised to quit)**



## Effects of Providing Smoking-Cessation Services in Conjunction With Lung Cancer Screening on Smoking Behavior

- Patient motivation as a requirement for treatment (i.e., an opt- in model) means that most smokers will not receive TDT
- **In contrast, treatment approaches for other chronic diseases (e.g., hypertension, asthma) use an opt-out model**
- Of 473 cancer patients who underwent a surgeon-led, brief smoking-cessation intervention concurrent with their cancer care : 78% accepted a referral to stop-smoking services; 36% stopped smoking at least temporarily, and another 10% either reduced smoking or set a future smoking quit date
- An automated tobacco-use assessment and telephone- based smoking-cessation support program for patients who had cancer identified at diagnosis/follow-up was highly effective for engaging patients in smoking-cessation treatment.



- Review of 13 smoking-cessation trials of adult smokers aged  $\geq 50$  years demonstrated that more intensive interventions and combined pharmacotherapy plus counseling yielded higher quit rates than brief advice, minimal counseling, or self-help materials.



---

Undergoing LCS or initial LCS discussion

---

**Teachable moment**

Illustrative physician quotes

*I suspect they do put that together and maybe that has a bigger impact on them because now they're perceiving that the risk is high enough that someone actually wants to do a CT scan. (C20)*

*It (LCS) might help move them along the readiness to try and do something about quitting smoking. (C6)*

Illustrative patient quotes

*It (LCS) made me think. I've been trying these past two and a half, three months. I'm very proud of myself. I've been trying my hardest to stop. (P8)*

*Yeah, it (LCS) does. It make me know that I really need to leave 'em [cigarettes] alone. (P12)*

*I'm 69, smoking is catching up on me...The worst thing I could think of would be the onset of cancer. (P19)*

---

**Not a teachable moment**

Illustrative physician quotes

*It's all related to stressors, not so much the CT screening. (C18)*

*I don't think it (LCS) affects their motivation. The biggest (motivator) will be pressure from family members. The second will be some sort of life event that has frightened them...a family member that's developed lung cancer. (C17)*

Illustrative patient quotes

*Not for me, it (the screening test) didn't matter...I have no support.*

*I have a lot of physical problems. (P3)*

*I have said my entire adult life whether you were a smoker or a nonsmoker, if you were genetically disposed to...cancer or anything else, you're going to get it and I'm not going to really worry about it. (P15)*

---

- Kathuria H, Koppelman E, Borrelli B, Slatore CG, Clark JA, Lasser KE, Wiener RS. Patient-Physician Discussions on Lung Cancer Screening: A Missed Teachable Moment to Promote Smoking Cessation. *Nicotine Tob Res.* 2020 Mar 16;22(3):431-439. doi: 10.1093/ntr/nty254. PMID: 30476209; PMCID: PMC7297104.

---

Results disclosure: positive results

---

**Teachable moment**

Illustrative physician quotes

*I think if they have a nodule, they may be more receptive to the concept of quitting. (C8)*

*I've had a few people start to be like, "Oh, I was worried it (nodule) was cancer. It could be then they're thinking a little more about quitting. (C3)*

Illustrative patient quotes

*Not a whole lot I can do but try to stop smoking to not make it progress even worse. (P5)*

*I've been smoking since I was 10 years old...until the date I had my first scan from this screening. ...The doctor told me 'We have some results on the scan, and we see something that's not good.' (P17)*

**Not a teachable moment**

Illustrative physician quotes

*Then again, they're really stressed at that time (of a positive test) so it's tough. (C21)*

Illustrative patient quotes

*Since they didn't really seem too upset or worried about [the nodule], I'm trying not to be....I mean it's in the back of my head I mean but I'm still smoking so it's way in the back of my head. (P15)*

- Kathuria H, Koppelman E, Borrelli B, Slatore CG, Clark JA, Lasser KE, Wiener RS. Patient-Physician Discussions on Lung Cancer Screening: A Missed Teachable Moment to Promote Smoking Cessation. *Nicotine Tob Res.* 2020 Mar 16;22(3):431-439. doi: 10.1093/ntr/nty254. PMID: 30476209; PMCID: PMC7297104.

Results disclosure: negative results

**Teachable moment**

Illustrative physician quotes

*I have patients who didn't have any nodules, but had severe emphysema on their CT and now they've quit smoking. (C2)*

Illustrative patient quotes

*When I had my CT scan, I was a little nervous. My doctor called and said ...  
My lungs were clear. I've been trying to stop smoking. I even cut down.  
...I feel good that I did take the test and know that I didn't have  
nothing, and no sign of no cancer. (P2)*

**Not a teachable moment**

Illustrative physician quotes

*We were hoping that there's a little bit of scare effect so that patients quit, but when it (LCS) is negative, (it can) also have the opposite reaction. (C12)*

Illustrative patient quotes

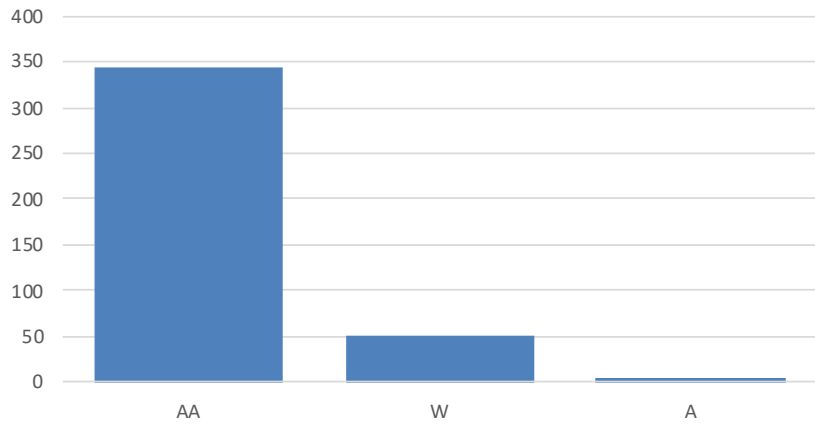
*She said everything looks fine ...then I'm thinking to myself well, I been smoking this long and everything's fine so why should I quit smoking? (P14)*

- Kathuria H, Koppelman E, Borrelli B, Slatore CG, Clark JA, Lasser KE, Wiener RS. Patient-Physician Discussions on Lung Cancer Screening: A Missed Teachable Moment to Promote Smoking Cessation. *Nicotine Tob Res.* 2020 Mar 16;22(3):431-439. doi: 10.1093/ntr/nty254. PMID: 30476209; PMCID: PMC7297104.

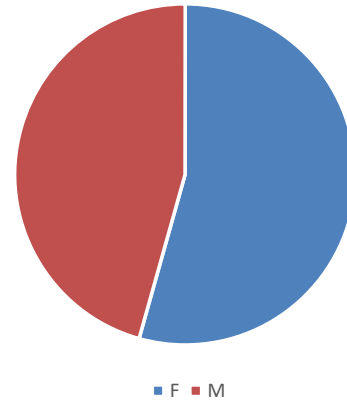


# Our Data

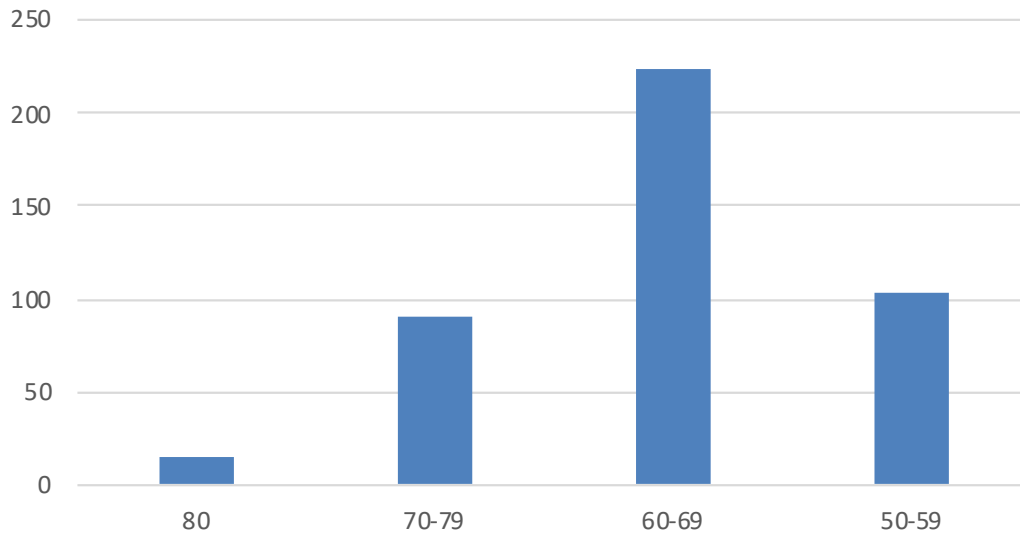
Race



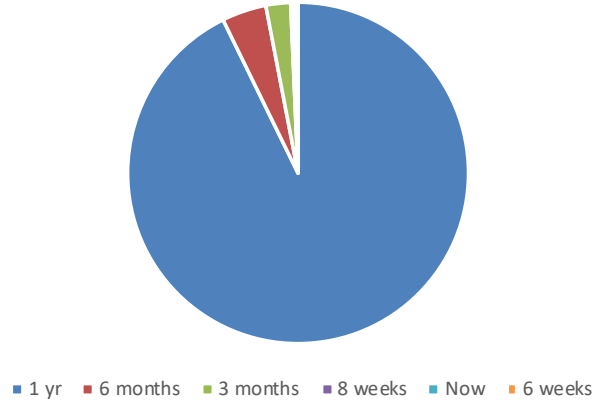
Gender



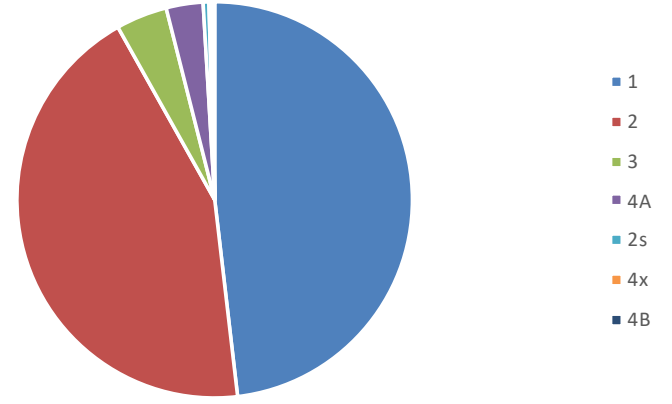
Age distribution



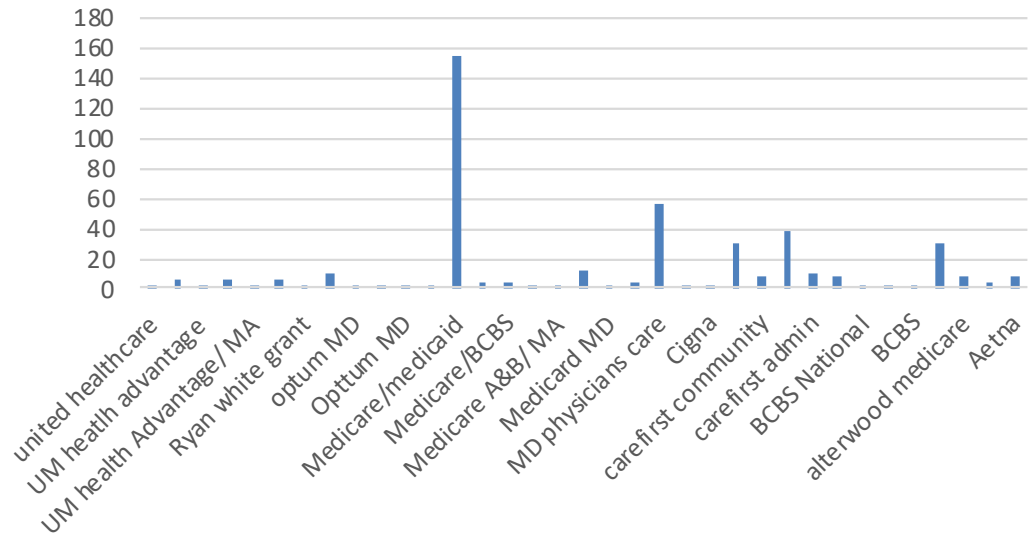
FU 'Recommendation '



Lung Rads



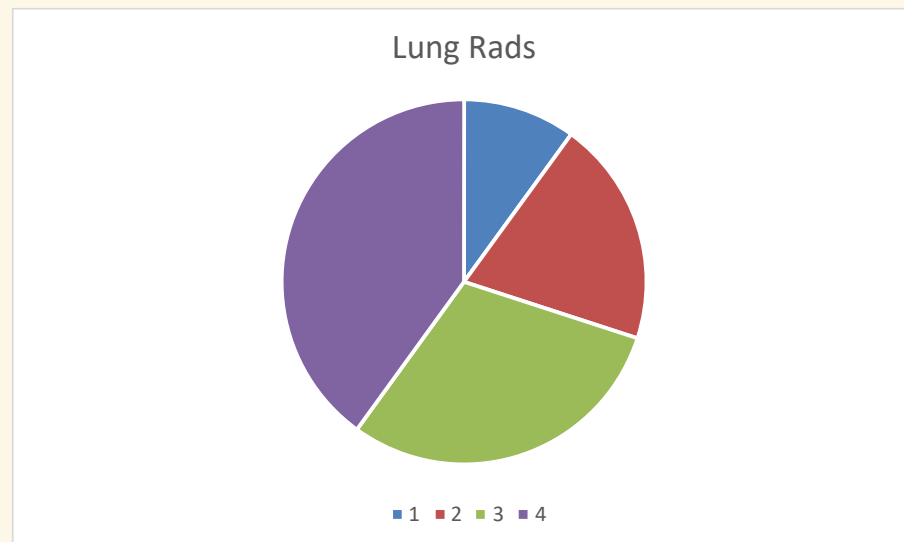
Insurance





# Our data

- 137/433 lost to FU
- 31.6% overdue for CT



# Our Institutional Barriers



LACK OF A NURSE NAVIGATOR



LACK OF AN ADEQUATE  
REMINDER SYSTEM



LACK OF AN AUTOMATED  
DATABASE WHICH CAN CREATE  
ADEQUATE REMINDERS





# Potential Solutions

- Prioritization of Lung cancer Screening by leadership
- Creation of an UMMS wide LCS steering committee
- Allocation of resources to LCS program



# Acknowledgements

- Dr. Charles White(Thoracic Radiologist)-Co-director Lung Cancer Screening Program
- Jayme Hallinan DNP, FNP-C-Assistant Director of the Lung Cancer Screening Program



- Maryland Lung Cancer Screening Collaborative
  - FY23 Priorities:
    - Recruitment
    - Data
    - Primary Care Provider Engagement
  - If you would like to join, please contact Brian Mattingly at [brian.mattingly@maryland.gov](mailto:brian.mattingly@maryland.gov).