

## **Online Data Supplement**

### **Clinical Equipoise and Shared Decision-Making in Pulmonary Nodule Management: A Survey of American Thoracic Society Clinicians**

Jonathan M. Iaccarino, James Simmons, Michael K. Gould, Christopher G. Slatore, Steven Woloshin, Lisa M. Schwartz, Renda Soylemez Wiener

**APPENDIX:** Complete web-based survey sent to American Thoracic Society clinicians.

**This survey is about how clinicians handle issues surrounding lung cancer screening and pulmonary nodule evaluation. Please the answer the following questions to make sure this survey is right for you.**

Do you see adult patients in outpatient clinic as part of your clinical responsibilities?

- Yes
- No → if responds no, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page

Which of the following best describes your current position?

- Physician (including residents, fellows, attendings / faculty)
- Nurse practitioner
- Physician's assistant
- Nurse (e.g., RN) → if selects, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page
- Respiratory therapist → if selects, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page
- Physical therapist → if selects, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page
- Student → if selects, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page
- Other → if selects, take to THANKS FOR YOUR TIME, BUT YOU ARE NOT ELIGIBLE page

**First we'd like to ask you some general questions about lung cancer screening.**

1. How familiar are you with the results of the National Lung Screening Trial (NLST)?

- Extremely familiar
- Somewhat familiar
- Slightly familiar
- Not at all familiar

2. Please rate the strength of the research evidence for low dose CT screening for lung cancer in your opinion.

- Very weak
- Weak
- Neither weak nor strong (Moderate)
- Strong
- Very strong
- Not sure

3. How familiar are you with the guidelines for low dose CT screening for lung cancer?

- Extremely familiar
- Somewhat familiar
- Slightly familiar
- Not at all familiar

*Please indicate how much you agree or disagree with the following statements.*

4. In general, screening tests...	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Are an important tool for public health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sometimes cause more harm than benefit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How does the effectiveness of low dose CT lung cancer screening for high risk individuals compare to these other interventions in reducing cancer death?

*Low dose CT screening for lung cancer is...*

	More effective	About the same	Less effective
Breast cancer screening with mammograms for women aged 50-74	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prostate cancer screening with PSA tests for men aged 65-74	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking cessation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Now we are interested in how you would respond to the following clinical scenarios about lung cancer screening.**

6. Imagine a 65 year old male patient of yours who smoked 2 packs of cigarettes a day for 20 years. In each of the following scenarios would you offer low dose chest CT for lung cancer screening?

	Definitely Yes	Probably Yes	Probably No	Definitely No
Patient quit smoking: 10 years ago Comorbidities: mild COPD (FEV1 70% predicted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient quit smoking: 25 years ago Comorbidities: mild COPD (FEV1 70% predicted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient quit smoking: 10 years ago Comorbidities: severe COPD (FEV1 30% predicted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. How much did each of the following considerations affect your decision about whether to offer patients for low dose CT lung cancer screening?

	A lot	A little	Not at all
<u>Risk-benefit tradeoffs</u>			
Screening reduces risk of death from lung cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High false positive rate of screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concern about overdiagnosis (finding an indolent tumor of minimal clinical significance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possibility of detecting incidental findings outside the lung that would require further work-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiation exposure from CT scans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potential financial burden on patient from lung cancer screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost-benefit ratio for screening at the healthcare system level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suitability of patient for surgical treatment of lung cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>External evidence</u>			
Evidence from clinical trials of CT screening for lung cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guidelines on who should be screened for lung cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opinions of my local colleagues about lung cancer screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Local context considerations</u>			
Access to low dose CT scanner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of local experts in thoracic surgery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of local experts to biopsy pulmonary nodules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System in place locally for following patients with pulmonary nodules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Many health care organizations are deciding whether to start a lung cancer screening program. We are interested in learning your views on implementation of lung cancer screening at your site.**

8. Has your primary clinical site implemented a formal CT lung cancer screening program?

- Yes
- No
- Not yet, but we are planning to start one
- I'm not sure

9. In your opinion, which is the ideal patient population for low dose CT screening for lung cancer for your site?

	<u>Patient age</u>	<u>Smoking history</u>	<u>Other criterion</u>
<input type="checkbox"/> NLST criteria; ACCP/ASCO guidelines	55-74	≥30 pack-years, quit within last 15 years	--
<input type="checkbox"/> USPSTF recommendation	55-79	≥30 pack-years, quit within last 15 years	--
<input type="checkbox"/> NCCN guidelines	≥50	≥20 pack-years	One other risk factor
<input type="checkbox"/> Targeted screening proposed by Kovalchik et al, NEJM 2013	--	--	Risk of lung cancer death in next 5 years >0.85%
<input type="checkbox"/> Other ( <i>please specify</i> ): _____			
<input type="checkbox"/> None of the above; I don't think lung cancer screening should be offered to anyone.			

10. How much of a barrier do you think each of the following would be to successful implementation of a lung cancer screening program at your primary clinical site?

	<b>A big barrier</b>	<b>A small barrier</b>	<b>Not a barrier</b>
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Pulmonologists do not buy-in to the evidence for screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCPs do not buy-in to the evidence for screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiologists are not supportive of implementing a screening program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Senior leadership at my site would not be interested in supporting a lung cancer screening program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patients at my site would not be interested in lung cancer screening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cost of a screening program is too high	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insufficient infrastructure for a screening program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insufficient staff available to run a screening program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Pulmonary nodules are commonly identified on CT scans performed for lung cancer screening or other reasons. We are interested in learning about how you evaluate pulmonary nodules for lung cancer.**

11. On average, how many new patients with a pulmonary nodule or lung cancer do you see per month?

- 0-2
- 3-5
- 6-10
- 20 or more

12. How comfortable do you feel directing evaluation of pulmonary nodules for cancer?

- Extremely comfortable
- Somewhat comfortable
- Not very comfortable

13. Does your primary clinical site use any of these methods to facilitate pulmonary nodule evaluation?

	Yes	No	Not sure
Radiology flags (alerts to ordering provider) when a new nodule is identified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inclusion of Fleischner Society guidelines in radiology report text when a nodule is found	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pulmonary review with radiology of all new pulmonary nodules identified on imaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Registry of patients with pulmonary nodules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dedicated clinic for pulmonary nodule evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virtual clinic (e-consults) for pulmonary nodule evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Same day pulmonary consults for patients with a new nodule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff member to facilitate nodule evaluation (e.g., scheduling appointments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient navigator services for patients undergoing nodule evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision support for pulmonary nodule evaluation linked to electronic medical record	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Which best describes how you and your patients make decisions about pulmonary nodule evaluation?

- I make the decision myself without input from my patient.
- I make the decision myself after seriously considering my patient's opinion.
- I share responsibility for the decision with my patient.
- I provide medical information and my opinion, and then let my patient make the decision.
- I provide only medical information and then let my patient make the decision.

Please imagine you are seeing the following patients in clinic.

**Case 1: A 46 year old female patient presents for follow-up of an abnormal chest CT.**

**HPI:** Three days ago she was in a motor vehicle accident and struck her chest against the steering wheel. No serious traumatic injury was found, but her chest CT showed a 15 mm solid, non-calcified nodule with smooth borders in the periphery of the right upper lobe. There are no prior films. The ED physician asked her to see you to decide on management. She is asymptomatic.

**Past Medical History:** well-controlled hypertension

**Social History:** Quit smoking 10 years ago, previously smoked 1 pack per day for 10 years.

**Family History:** no lung cancer



15. What is the chance that the pulmonary nodule is cancer?

Low (<10%)

Moderate (10-60%)

High (>60%)

16a. Which of the following would you consider to be **appropriate management alternatives**?

	<b>Very appropriate</b>	<b>Somewhat appropriate</b>	<b>Not appropriate</b>
No further work-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bronchoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transthoracic needle lung biopsy (i.e., CT-guided biopsy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surgical resection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PET scan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surveillance (serial CT scans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16b. If you answered **very or somewhat appropriate** for **surveillance**, when would you get the next CT scan?

1 month

3 months

6 months

12 months

**Case 2: A 64 year old female patient comes in for follow-up of an abnormal chest CT.**

**HPI:** Ms. J was seen in the emergency department last week with acute onset of sharp chest pain. She underwent a CT pulmonary angiogram. No PE was found, but a solid, 20 mm pulmonary nodule with irregular borders was noted in the left upper lobe. Chest pain has resolved and she has no other symptoms.

**Past Medical History:** depression

**Social History:** Has smoked 10 cigarettes per day for 30 years.

**Family History:** cousin with lung cancer



17. What is the chance that the pulmonary nodule is cancer?

Low (<10%)

Moderate (10-60%)

High (>60%)

18a. Which of the following would you consider to be **appropriate management alternatives**?

	Very appropriate	Somewhat appropriate	Not appropriate
No further work-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bronchoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transthoracic needle lung biopsy (i.e., CT-guided biopsy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surgical resection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PET scan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surveillance (serial CT scans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18b. If you answered **very or somewhat appropriate** for **surveillance**, when would you get the next CT scan?

1 month

3 months

6 months

12 months



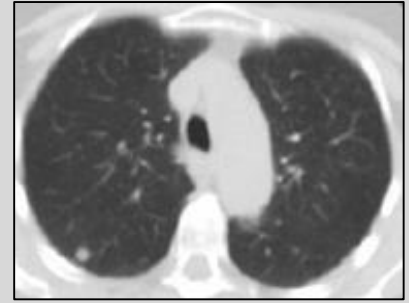
**Case 3: A 50 year old man presents for follow-up of an abnormal CT.**

**HPI:** Mr. R underwent cholecystectomy last month. On a routine pre-operative film a small pulmonary nodule was seen. A chest CT confirmed a solid 7 mm non-calcified nodule in the right lung. He denies any respiratory symptoms or weight loss.

**Past Medical History:** gallstones, migraine headaches

**Social History:** Lifelong non-smoker. No concerning exposures.

**Family History:** no lung cancer



19. What is the chance that the pulmonary nodule is cancer?

- Low (<10%)                       Moderate (10-60%)                       High (>60%)

20a. Which of the following would you consider to be **appropriate management alternatives**?

	<b>Very appropriate</b>	<b>Somewhat appropriate</b>	<b>Not appropriate</b>
No further work-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bronchoscopy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transthoracic needle lung biopsy (i.e., CT-guided biopsy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surgical resection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PET scan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surveillance (serial CT scans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20b. If you answered **very or somewhat appropriate** for **surveillance**, when would you get the next CT scan?

- 1 month                       3 months                       6 months                       12 months

**We'd like to know your thoughts on the research evidence for pulmonary nodule evaluation.**

21. Please rate the strength of the research evidence for management of pulmonary nodules in your opinion.

- Very weak
- Weak
- Neither weak nor strong (Moderate)
- Strong
- Very strong
- Not sure

22. Suppose there were a randomized trial to compare different strategies of pulmonary nodule evaluation. If endemic mycosis was unlikely based on your patient's history, would you invite your patient to enroll in a research study like the ones described below?

	Definitely Yes	Probably Yes	Probably No	Definitely No
<p><b>Entry criteria:</b> Nodule 20-30 mm, acceptable surgical risk profile, moderate-high risk of cancer based on PET scan and clinical risk factors</p> <p><b>Study arms:</b> non-surgical biopsy vs wedge resection</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Entry criteria:</b> Nodule 8-15 mm, acceptable surgical risk profile, low-moderate risk of cancer based on PET scan and clinical risk factors</p> <p><b>Study arms:</b> non-surgical biopsy vs CT surveillance at intervals consistent with Fleischner guidelines</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Entry criteria:</b> Nodule &lt;8 mm, low risk cancer</p> <p><b>Study arms:</b> CT surveillance at intervals consistent with Fleischner guidelines vs less frequent surveillance</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Finally, we would like to learn a little bit about you.**

23. What is your primary clinical specialty?

- Pulmonary / critical care medicine
- Thoracic surgery
- Internal medicine / primary care
- Radiology
- Other (please specify): \_\_\_\_\_

24. How many years has it been since you completed clinical training?

- More than 20 years
- 11-20 years
- 6-10 years
- Less than 5 years
- I am currently enrolled in a training program.

25. Which of the following best describes how your clinical time is divided?

- Exclusively outpatient
- Mostly outpatient
- Mostly inpatient

26. What percent of your time at work is devoted to clinical practice?

- Less than 25%
- 25-49%
- 50-74%
- 75% or more

27. How would you characterize your primary practice setting? (*Select one*)

- Academic hospital or outpatient clinic
- VA hospital or outpatient clinic
- Community hospital or outpatient practice
- Group or staff model HMO
- Other (please specify): \_\_\_\_\_

28. Is your primary clinical site in an urban, suburban, or rural setting?

- urban
- suburban
- rural

29. Where is your primary clinical site?

- United States: Northeast
- United States: South
- United States: Midwest
- United States: West
- Canada
- Mexico, Central America, or South America
- Europe
- Africa
- Asia
- Australia or New Zealand
- Other (please specify): \_\_\_\_\_

30. Are you male or female?

- Male
- Female

**Thank you for completing this survey! Your participation is greatly appreciated.**

If you have additional thoughts or comments about lung cancer screening or pulmonary nodule evaluation that you would like to share, please enter them here:

*If you would like to receive an Amazon.com gift card as a thank you for participating in the survey, please fill in your name and email address. This information will be stored separately from your survey responses and will only be used for purposes of delivering the gift card.*

*First (given) name:* \_\_\_\_\_

*Last name (surname):* \_\_\_\_\_

*Email address:* \_\_\_\_\_