

Lung Screening Logistics

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Disclosures

- None

Objectives

- Describe the necessary components for performing high quality lung cancer screening and potential barriers to the establishment and maintenance of a screening program.
- Discuss the advantages and disadvantages of centralized and decentralized lung screening programs.
- Present areas of opportunity for the radiologist to improve enrollment and throughput in screening for lung cancer.

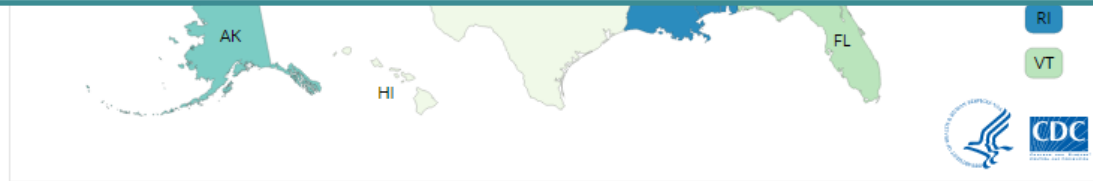
Lung Cancer Deaths in Tennessee

Deaths from Lung Cancer by State

Rates of dying from lung cancer also vary from state to state.

Lung and Bronchus Cancer
Death Rates* by State, 2013†

Less than 2% of eligible Tennesseans are enrolled in a lung screening program



*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

Lung cancer screening rates: Data from the lung cancer screening registry.

Source: U.S. Cancer Statistics Working Group. [United States Cancer S 1999–2013 Incidence and Mortality Web-based Report](#). Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2016.

Danh Pham, Shruti Bhandari, Malgorzata Oechsli, Christina M Pinkston, Goetz H. Kloecker

American College of Radiology

Vanderbilt Lung Screening Program

- Participated in the National Lung Screening Trial
- Enrollment as of May, 2019
 - Over 1400 patients enrolled
 - > 2400 screening examinations performed
 - > 100 referrals made to the Vanderbilt Lung Nodule Clinic
 - 50 cancers diagnosed
 - 9% of patients with significant incidental findings with >80% of these patients receiving appropriate clinical follow up

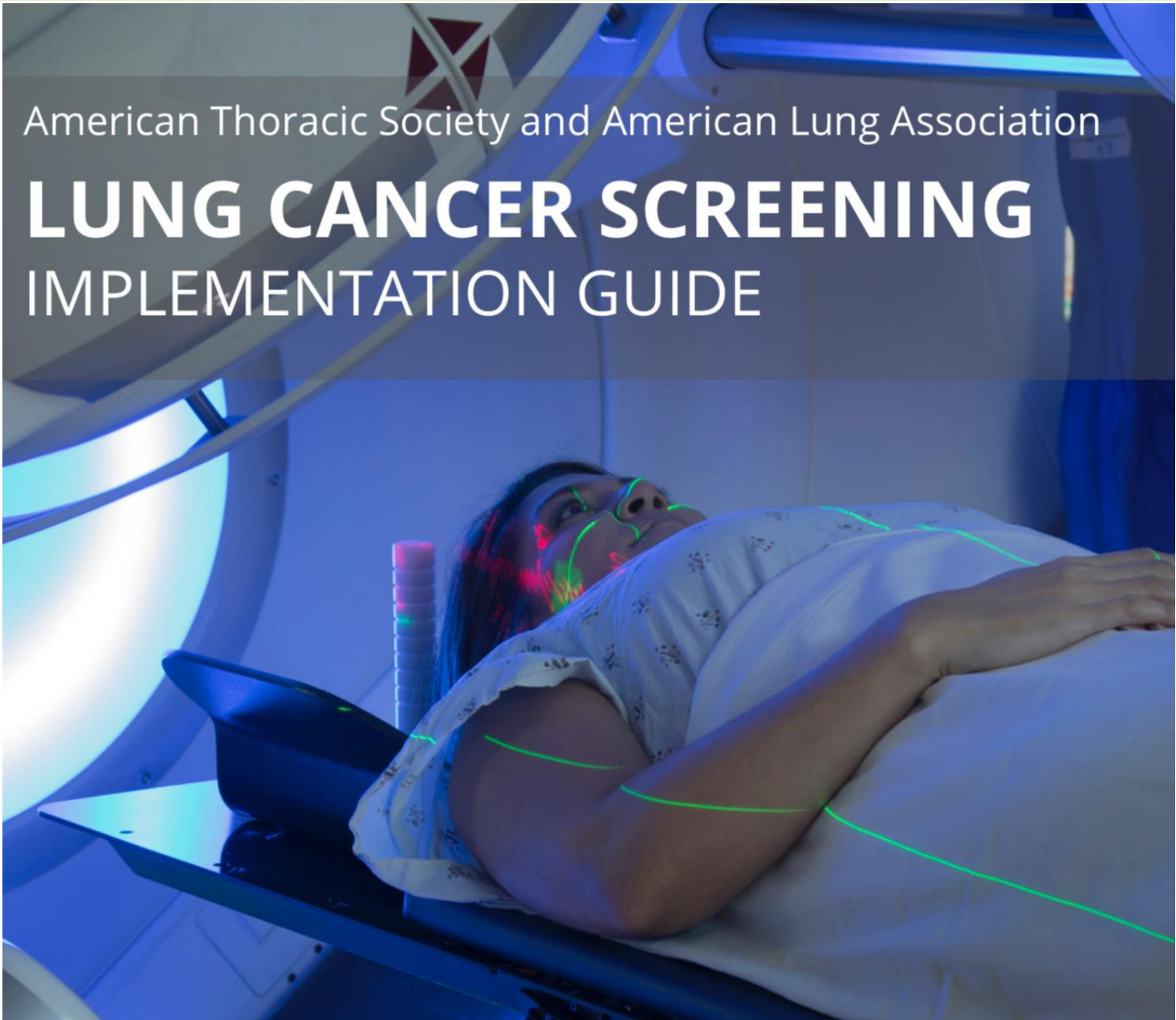
Findings in the VLSP as of 5/1/19

LungRADS	Patients
1 and 2	2111
3	170
4A	87
4B	56
4X	3

Tumor Stage	Patients
1A and 1B	18
IIA and IIB	7
IIIA and IIIB	9
IV	3
Non-lung CA	6
Unstaged	3

American Thoracic Society and American Lung Association

LUNG CANCER SCREENING IMPLEMENTATION GUIDE



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Lung cancer screening eligibility from CMS

Participants

Age: 55 – 77

30 Pack-years smoking and less than 15 years since quitting

No signs or symptoms of lung cancer

Clinician

Shared Decision Making Visit – Benefits/Harms of Screening,
Follow-up diagnostics tests, over-diagnosis, FP rate, radiation exposure
Counseling on adherence to the screening program and smoking cessation

Radiologist

Board Certified, Training in diagnostic radiology and radiation safety
Supervision and interpretation of 300 chest CTs in past 3 years
CME to ACR standard

Radiology Imaging Facility

LDCT with CTDIvol < 3.0mGy for standard patients
Utilizes a standardized lung nodule classification and reporting system
Collects and submits data to a CMS-approved registry

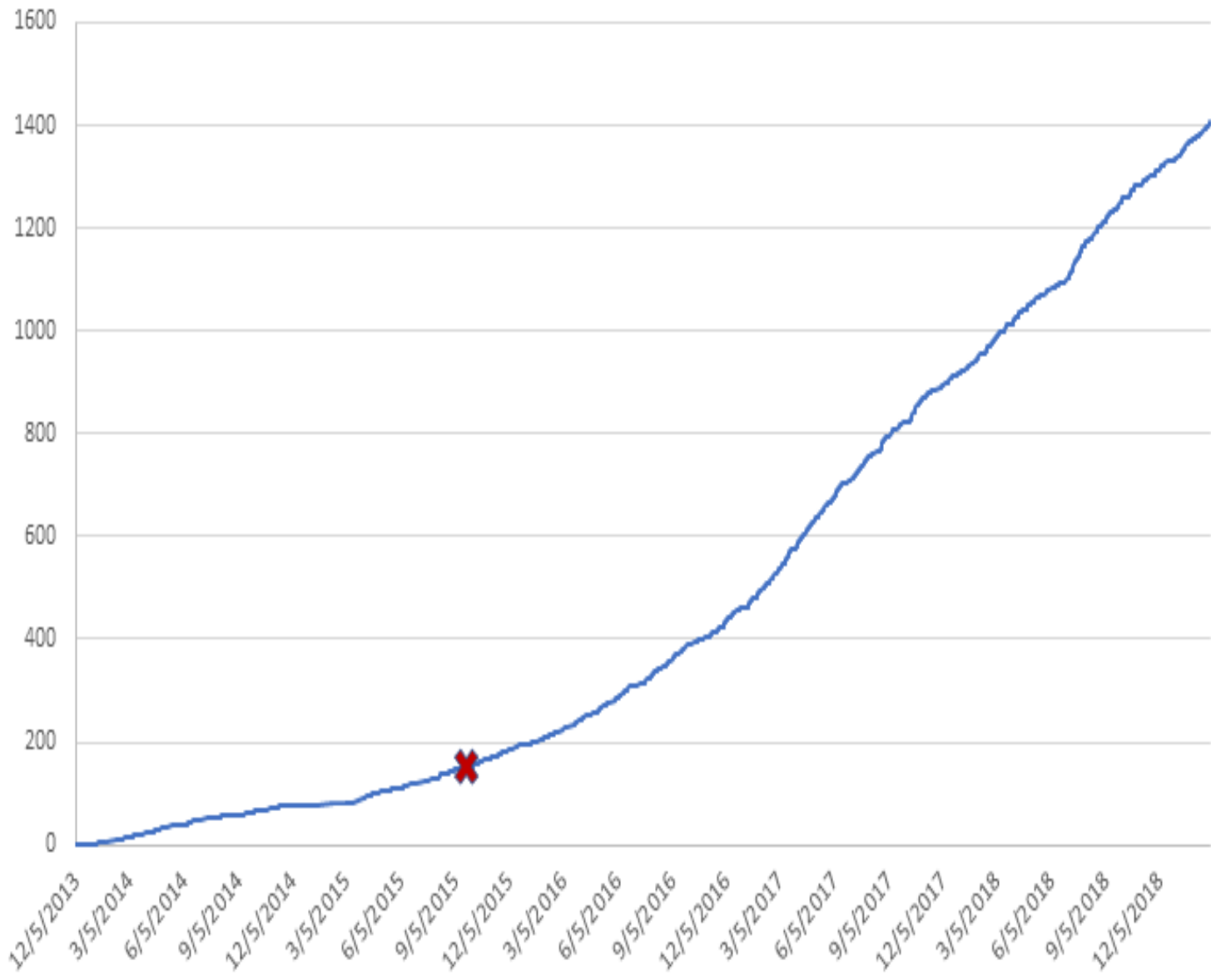
Interdisciplinary team

- Radiologists
- Primary Care Providers
- Pulmonologists
- Surgeons
- Radiation Oncologists
- Medical Oncologists
- *Nurse practitioners

Centralized Lung Screening Program

- Actively recruits eligible patients
- Conducts education and shared-decision making visits
- Assists in smoking cessation
- Performs and interprets all screening studies
- Arranges follow up exams and tracks clinical and outcome data
- Communicates results to patients and referrers
- ***requires a dedicated LCS coordinator**

Total number of new LCS patients enrolled over time



Ordering a LCS Consultation

In eStar:

- Search for "lung cancer screening" within the Medications and Orders field.
 - Please save as a favorite by clicking the star next to the name.
 - Using other orders for lung cancer screening will result in incorrect billing and scheduling.
- Choose One Hundred Oaks Imaging, Hillsboro Imaging or Cool Springs Imaging as "Location" to route the order to the quickest scheduling

The screenshot shows the eStar Order Search interface. At the top, there is a search bar containing "LUNG CANCER SCREENING" and a magnifying glass icon. To the right of the search bar are tabs for "Browse", "Preference List", "Facility List", and "Database". Below the search bar, there are three expandable sections: "Panels" (No results found), "Medications" (No results found), and "Procedures" (expanded). The "Procedures" section contains a table with the following data:

Name	Type	Pref List	Px Code	Resulting Agencies
Lung cancer screening	Ima...	VUMC...	IMG10896	

Shared-Decision Making Visit

Reason for visit: Lung cancer screening counseling and shared decision making visit.

Chief Complaint: The patient has a significant smoking history and is interested in learning more about screening.

Smoking Status:

Do you now smoke cigarettes every day, some days, or not at all: ***

When did you last smoke: ***

Years quit (enter for 0 for current smoker or enter 1.5 for 1 year, 6 months: ***

LIFETIME SMOKING HISTORY 1 pack = 20 cigarettes

	Years of Smoking	Pack(s) per day	Pack-years
I	***	***	***
II			
III			
IV			
V			
Totals:	***		*** Total Pack-Years

Ever been diagnosed with COPD/emphysema?	{YES DEFAULT/NO:34021::"Yes"}
Personal history of any cancer?	{YES DEFAULT/NO:34021::"Yes"}
Family history of lung cancer?	{YES DEFAULT/NO:34021::"Yes"}
Patient Education?	{VUMC AMB INT PUL EDUCATION LEVEL:2101550422}
Race:	{VUMC AMB INT PUL RACE:2101550421}
Height:	***
Weight:	***

The patient's probability of developing lung cancer in the next 6 years is: ***

<1% = Low Risk

1-2% = Moderate Risk

>2% = High Risk

Decentralized and Hybrid Programs

- Decentralized program
 - Performs the LCS exam and the interpretation
 - Referring provider is responsible for all other components of screening
- Hybrid program
 - Incorporates some centralized processes and some decentralized

Clinically significant findings

- How do you define clinically significant findings on LDCT for lung screening?
 - VLSP defines clinically significant incidental findings as those that require additional imaging or laboratory testing for diagnosis or follow up
 - We exclude coronary artery disease (CAD) and emphysema as these are not unexpected findings in our patient population
 - CAD is reported with an estimated Agatston score
 - *6 of the 50 cancers we have diagnosed are non-lung cancers

Table 1. Summary of Socioeconomic Factors on Appropriate Follow-Up

Variable	Appropriate Follow-Up		P Value
	Yes	No	
Gender — no. (%)			0.336
Male	48 (44)	14 (13)	
Female	41 (37)	7 (9)	
Race — no. (%)			1.000
Caucasian	77 (70)	18 (16)	
Non-caucasian	12 (11)	3 (3)	
Education Level — no. (%)			0.030 ^a
High School or Less	31 (28)	15 (14)	
More than High School	58 (53)	6 (5)	
Insurance Status — no. (%)			0.778
Medicare	68 (62)	15 (14)	
Commercial	21 (19)	6 (5)	

^aUsing Fisher's exact test of independence, education level was significant at $\alpha = 0.05$

Kapoor et al, abstract accepted for presentation at the American College of Radiology Annual Meeting in May, 2019

Screening Registry Reporting

LUNG CANCER SCREENING IMPLEMENTATION GUIDE

Search



DOWNLOAD GUIDE

IMPLEMENTATION
OF LUNG CANCER
SCREENING PROGRAM

SHARED DECISION
MAKING

SMOKING CESSATION
COUNSELING &
REPORTING

REGISTRY REPORTING &
DOCUMENTATION OF
ORDERS IN THE EMR

DATA TRACKING &
SURVEILLANCE

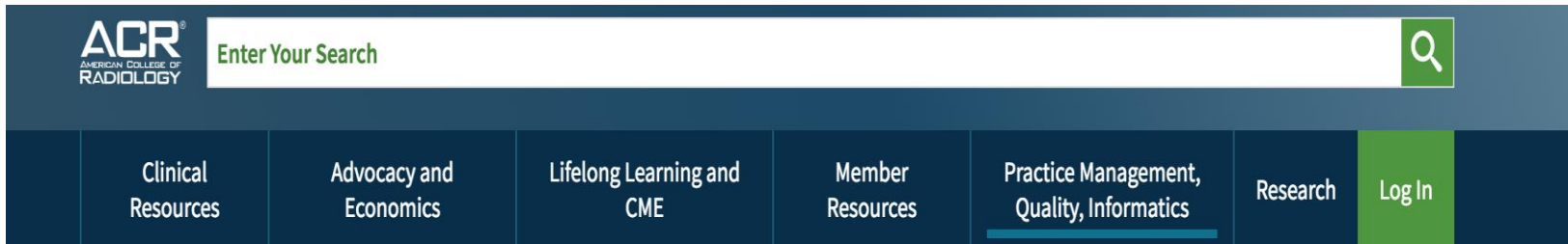
NURSE NAVIGATION
& COORDINATORS

RESOURCE
SECTION

PATIENT
CORNER

Registry Reporting & Documentation of Orders in the EMR

ACR Registry Online Submission



How to Submit Data

Determine which method you will use to submit data to the LCSR from the list below. Refer to our [LCSR Data Submission Overview](#) for information about submitting and working with LCSR data.

1. Submit manually using our [online form](#)
2. Upload a 'flat file' (bar |) delimited) document [configured according to these instructions](#)
3. Have your IT department submit data using [web-based services](#)
4. Have one of our Certified Software Partners (listed below) submit data on your behalf

ACR Registry Reporting Overview

- LCSR data are captured in the *LCSR Exam* form in four sections:
 - Patient information includes name, SSN, DOB, etc. and baseline or annual exam date
 - General information includes exam data (patient height, weight and smoking status) and study-related data (imaging modality, CT scanner used, and exposure)
 - Follow-up within 1 year – imaging, biopsy, surgery, etc. within one year of last screening exam
 - Additional risk factors (optional)

Reporting Software Options

Certified Software Partners



Opportunities to improve enrollment

- **Saving Lives with Early Detection of Lung Cancer:** *Promoting Enrollment of Women Engaged in Breast Screening in a Lung Screening Program*
- Funded by the Vanderbilt-Ingram Cancer Center Young Ambassadors



Vanderbilt Lung Screening Program

Early Detection Saves Lives
VanderbiltLungScreening.com



Programa de Examen de Pulmón

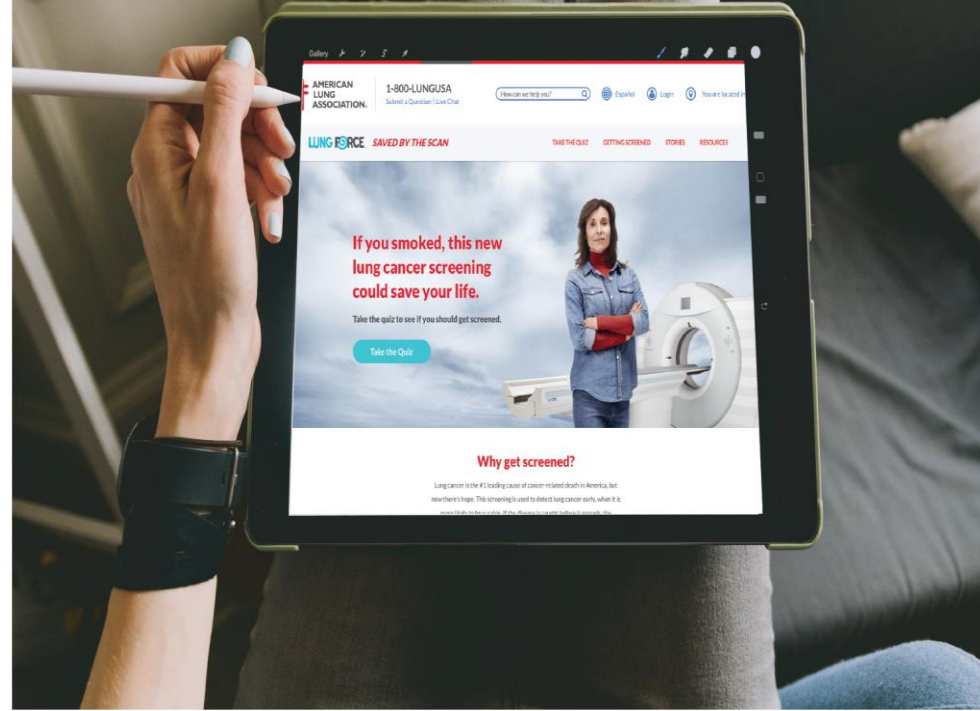
LA DETECCIÓN TEMPRANA SALVA VIDAS

VanderbiltLungScreening.com



Vanderbilt Lung Screening Program

Early Detection Saves Lives
VUMC.org/Radiology/Lung





Mammography saves lives.
So does lung screening.

Conclusions

- There are many necessary components to establishing a successful screening program
 - An interdisciplinary team is essential
 - ATS and ALA Lung Cancer Implementation Guide is a great place to start
- Centralized, decentralized, and hybrid programs can all be successful in the appropriate environment
- Continue to think about opportunities to improve enrollment – we can save so many lives!

Questions