

# **VHA Demonstration Project for Lung Cancer Screening Using Low-Dose Chest CT Screening**

**ATS**

**San Francisco 2016**

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# Disclosures for JKB

- Co-site director for lung cancer screening program at SFVAMC
- Helped organize this VA Interest Group Meeting

# Goals of talk

- Describe the implementation of the VA's 8-site Demonstration Project for Lung Cancer Screening
- Show preliminary data, as of 3/30/2015, from the 8 sites, as well as current updated data from one site (SFVAMC)
- Compare data from VA's Demonstration Project to those from National Lung Screening Trial
- Suggest resources that would be needed to broaden availability of lung cancer screening within the VA

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

The National Lung Screening Trial Research Team\*

# Methods (NLST)

## Eligibility:

- 55 - 74 years of age
- 30 PY's smoking or quit within past 15 years
- [9 million Americans would meet inclusion criteria]

## 53,454 persons enrolled

- 26,722 randomized to low dose-CT
- 26,732 randomized to CXR as control

## Period of enrollment: 8/02 – 4/04

- Screening : 8/02 – 9/07
- Data collection: through 12/09
- Median F/U: 6.5 years

# Screenings (NLST):

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3 screenings:

T0, T1, T2 at 1 year intervals

Positive test result =

- Low dose CT scan: non-calcified nodule measuring at least 4mm in any diameter
- Chest x-ray: any noncalcified nodule or mass
- Either: adenopathy, effusions could be called positive

# NLST Results

	Low Dose CT	Chest X-ray
Positive screening exams	24%	7%
False positive exams	96%	95%
Participants with $\geq 1$ positive exam	39%	16%
Lung cancers diagnosed	645 cases/100,000 person-years	572 cases/100,000 person-years
Lung cancer mortality	247 deaths/100,000 person-years <b>20% relative reduction</b>	309 deaths/100,000 person-years
All-cause mortality	7% relative reduction (due to lung cancer mortality reduction)	Comparison
Number needed to screen for 3 years to prevent 1 death over 7 years	320	NA

# Lung cancers in NLST by time of detection using LDCT scans

Screening Round	Total Population	Number of New Lung Cancers
First Chest CT (T <sub>0</sub> )	26,309	270
Second Chest CT (T <sub>1</sub> )	24,715	168
Third Chest CT (T <sub>2</sub> )	24,102	211
After 3 CTs		367



# Early Detection with Low-Dose Chest CT Scans in NLST

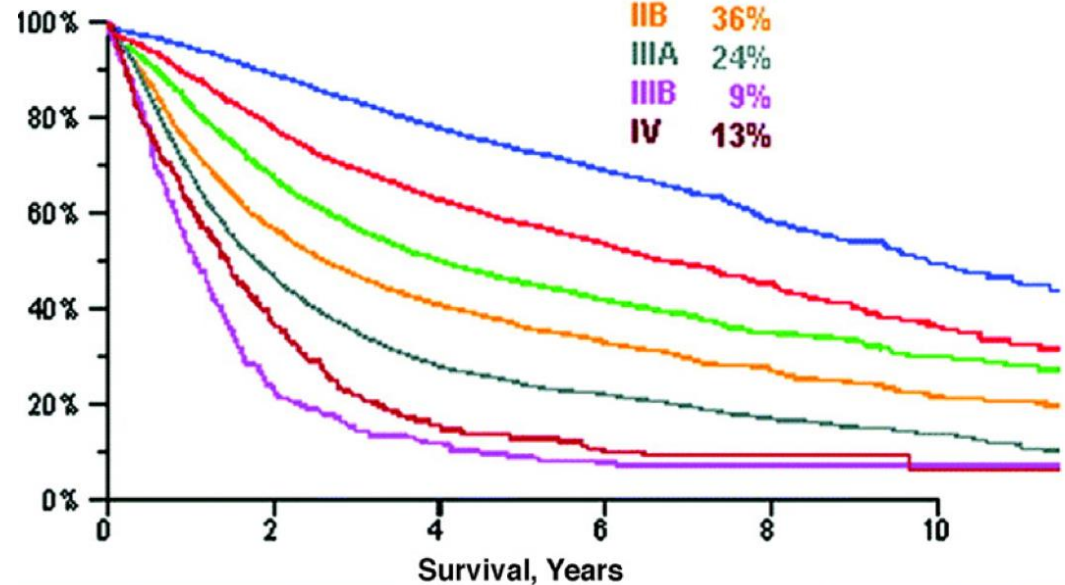
Positive  
Screening Test  
(N = 649)

Stage

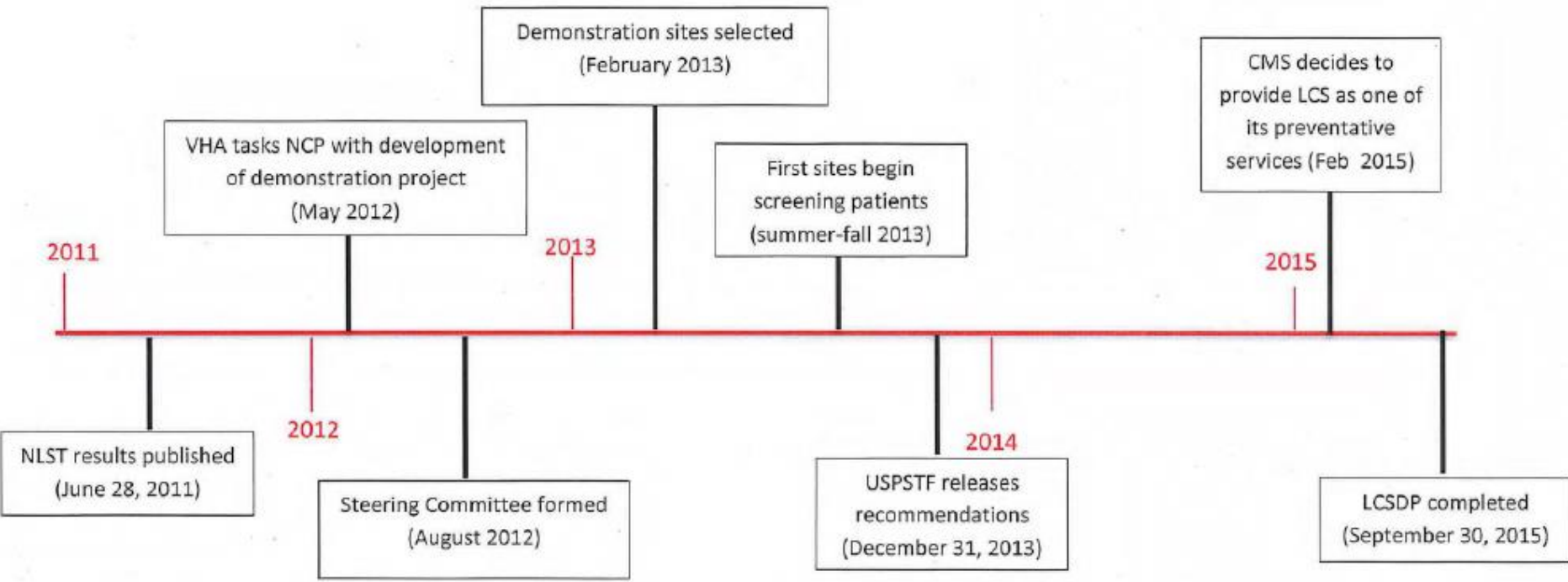
IA	329/635 (51.8)
IB	71/635 (11.2)
IIA	26/635 (4.1)
IIB	20/635 (3.1)
IIIA	59/635 (9.3)
IIIB	49/635 (7.7)
IV	81/635 (12.8)

5-Year

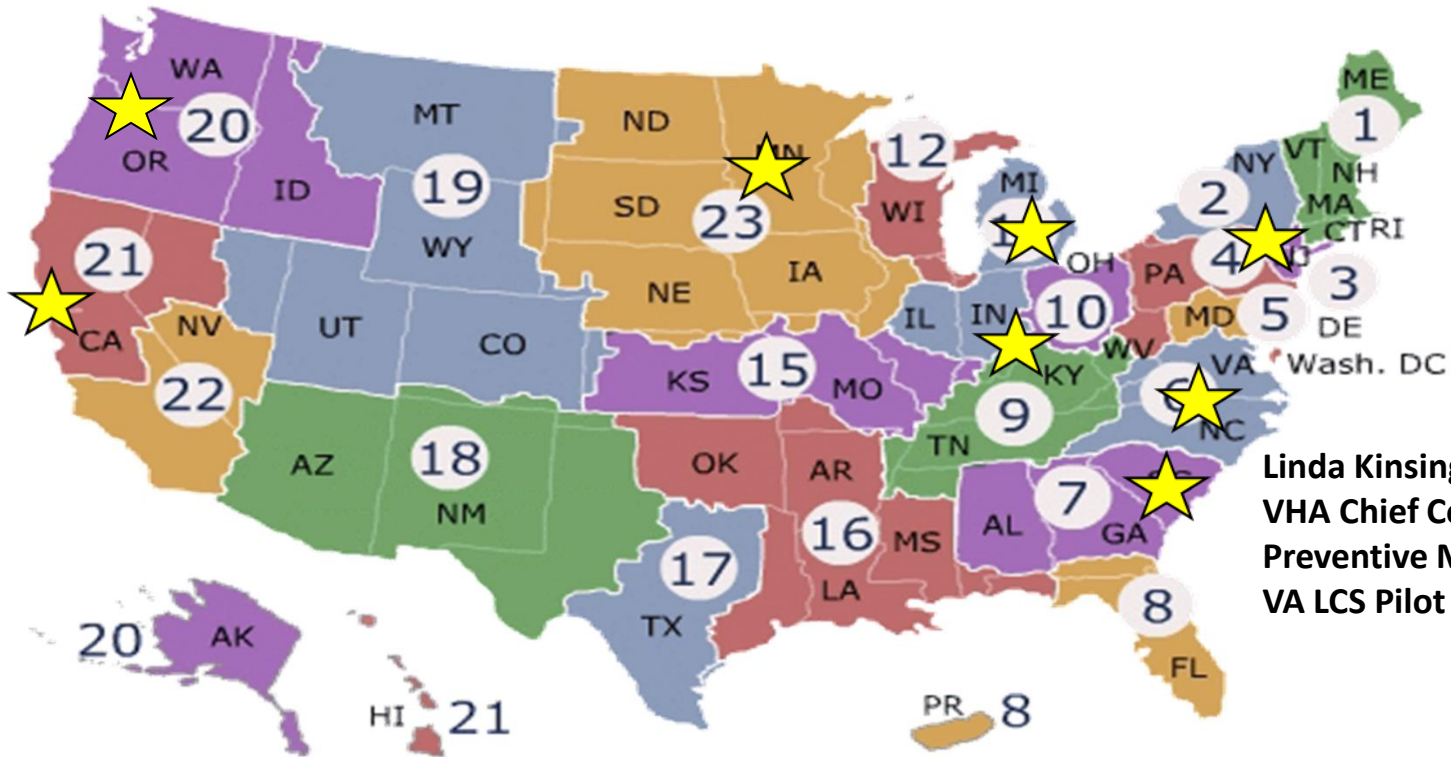
IA	73%
IB	58%
IIA	46%
IIB	36%
IIIA	24%
IIIB	9%
IV	13%



## Lung Cancer Screening Demonstration Project in the VA: Timeline



# LCS Demonstration Sites



Linda Kinsinger, MD, MPH,  
VHA Chief Consultant for  
Preventive Medicine, Nat'l  
VA LCS Pilot Program Director

VISN 3 VA New York  
Harbor  
Healthcare  
System

VISN 7 Charleston VAMC

VISN 11 Ann Arbor VAMC

VISN 21 San Francisco  
VAMC

VISN 6 Durham VAMC

VISN 8 Cincinnati VAMC

VISN 20 Portland VAMC

VISN 23 Minneapolis VAMC

# Questions for VA's Clinical Demonstration Project

- What is the uptake of screening among Veterans and their PCP's ?
- What are the outcomes in Veterans?
- Can screening be implemented in the VA with the same level of safety as in NLST?
- What additional resources would be needed to begin more wide-spread use of LDCT for screening in the VA?

# Program Elements

- Full-time coordinator at each site
- Accurate identification of eligible patients from EHR
- Shared decision-making, embedded smoking cessation
- Web based tracking tool for LCS and lung nodules
- Multidisciplinary conferences for cancer/suspected ca

# What new resources did the VA provide at each site?

- Full-time coordinator at each site
- Accurate identification of eligible patients from EHR: clinical reminders
- Shared decision-making, embedded smoking cessation
- Web based tracking tool for LCS and lung nodules
- Multidisciplinary conferences for cancer/suspected ca
- Lots of education for site directors and coordinators

# Patient Selection Criteria for VA LCS DP\*

**Aged 55 – 80**

**Active smoking or quit < 15 years ago**

**At least 30 pack-year smoking history**

**Exclusions:**

- **history of lung, liver, pancreatic, or esophageal cancer**
- **life expectancy < 6 months for other reasons**

**\*As per USPSTF 2013 Guidelines**

# Use of clinical reminders to identify patients during visits to primary care clinics

## TPY Reminder

- On if patient 55-80
- LVN completed

## Provider Reminder

- On if TPY criteria met
- PCP completed

Reminder Resolution: Tobacco Pack Year History

\*\*Please document regarding CIGARETTES ONLY - NOT other forms of tobacco or e-cigarettes.\*\*

Lifetime non-cigarette smoker or smoked FEWER THAN 100 cigarettes/lifetime

Current cigarette smoker

How many years has the patient smoked?  
\*\*Enter responses as a NUMBER not as a word or fraction.  
(For example USE "1" not "one", use 1.5 not 1 1/2.)

# of years: \*

<-- Click here to view instructions for calculating packs/day.

Average number of packs/day over the entire time patient smoked:  
\*\*\*Select ONLY one Checkbox OR enter NUMERIC VALUE\*\*\*

Packs/day: \*

0.25  0.5  0.75  1.0  1.5  2.0  2.5  3.0  3.5  4.0  4.5

Former cigarette smoker but now quit

Patient declines/unable to give complete smoking history.



Reminder Resolution: Initial Lung CA Screen (Provider)

This reminder displays for patients age 55-80 who are current users or quit smoking less than 15 years ago, and have a 30 or more pack year smoking history. These patients are potential candidates for lung cancer screening.

SMOKING HISTORY: No data available

\*\*\*\*\*

No clinical exclusions, patient is a current candidate for the lung cancer screening project.

[Link to patient brochure on lung cancer screening](#)

Chest CT within the past 12 months outside of this VA.

Patient agrees to lung cancer screening. Lung cancer screening information provided and low dose CT will be ordered.

Refer patient to lung cancer screening coordinator for more information. Consult will be ordered.

Patient declines lung cancer screening THIS YEAR ONLY. Will re-check in one year. Lung cancer screening information provided.

Patient declines lung cancer screening INDEFINITELY. Patient informed he/she may request screening up to age 80. Lung cancer screening information provided.

Patient is NOT a current candidate for lung cancer screening due to:



- History of lung cancer
- Current symptoms which may be suggestive of lung cancer
- Receiving active oncologic therapy for cancer, except

Clear Clinical Maint Visit Info < Back Next > Finish Cancel

Clinical Reminder Activity





# Shared Decision Making Brochure



U.S. Department of Veterans Affairs  
Veterans Health Administration  
Patient Care Services  
Health Promotion and Disease Prevention

## Screening for Lung Cancer





**REMEMBER:** The best way to prevent lung cancer is to **STOP SMOKING**. If you are still smoking, talk with your VA health care team and call 1-855-QUIT VET (1-855-784-8838). **WE CAN HELP!**

Lung cancer is the leading cause of cancer death in the United States. Lung cancer begins when abnormal cells in the lung grow out of control. Unfortunately, many times lung cancer does not cause symptoms until it has spread to other parts of the body. However, the most common type—non-small cell lung cancer—can sometimes be cured if it is found early enough.

### Should I be screened for lung cancer?

You should consider being screened if you have all three of these risk factors:

- 55–80 years old **and**
- A current smoker or a former smoker who quit less than 15 years ago **and**
- A smoking history of at least 30 pack-years (this means 1 pack per day for 30 years or 2 packs a day for 15 years, etc.). The more you smoke and the longer you smoke, the higher your risk for lung cancer.

### What is screening?

- Screening is looking for a disease before a person has any symptoms. Screening helps find lung cancer in an early, more treatable stage.
- Based on research, if a group of 1000 people were screened once a year for 3 years, 3 fewer people

in 1000 would die of lung cancer after 6 years. This means that, instead of 21 people, 18 people per 1000 would die of lung cancer.

### Why not screen everyone?

- There is no proof from research that it is best to screen everyone.
- Screening people who are not at high risk or who are very ill may cause more harm than good. False alarms can lead to more testing and risk of harm.

### Are there any symptoms of lung cancer that I should watch for?


If you notice any of the following, you should contact your health care team:


- Have a new cough that doesn't go away
- Notice a change in a chronic cough
- Cough up blood, even a small amount
- Develop shortness of breath or chest pain
- Lose weight without trying

### Is there a cost for the screening?

If you are charged co-pays for your VA visits, you will be charged a \$50.00 co-pay for the day you have the low-dose chest Computed Tomography scan (LDCT). Talk with the Lung Cancer Screening coordinator if you are charged co-pays. Scheduling the scan on the same day as another visit may decrease the total charges.

# LCS CT Radiology Report in EHR

**VA**  U.S. Department of Veterans Affairs  
Veterans Health Administration  
Patient Care Services  
Health Promotion and Disease Prevention

 **LUNG CANCER SCREENING  
DEMONSTRATION PROJECT**

## Radiology Reporting Dictation Guide

### NON-CONTRAST LOW-DOSE CHEST CT FOR LUNG CANCER SCREENING

**COMPARISON:** [ <date> | None ]

**TECHNIQUE:** [ ] (state if study is of limited quality)  
[ ] (dose of LDCT)

**FINDINGS:** **Nodules:** (The nodule of greatest concern (usually the largest nodule that is not clearly benign) should be listed, including details about its location, size, and other features (listed below). If both solid and subsolid nodules are present, the largest in each category should be listed. Any nodules with suspicious features (e.g., spiculation, growth, etc.) should also be listed. Nodules that are not specifically detailed should be referenced by a general statement, such as "Several other smaller nodules are present.") **NOTE:** Set Diagnostic Code 945 LUNG NODULE, REQUIRES FOLLOW-UP for all patients with lung nodules that require follow-up.

**Nodule:**

**Average diameter:** [ ] (see reverse for notes about measuring average diameter)

**Density:** [ solid | ground-glass | mixed solid/ground glass ]

**Location:** [ lobe ]

**Image:** series [ # ] image [ # ]

**Suspicious features:** [ spiculated border | other ]

**Other characteristics:** [ cavitory | other ]

**Change in diameter:** [ ] (if prior CT is available, amount and over what time)

**Other lung findings:** [ ]

**Mediastinum:** [ ]

**Pleura:** [ ]

**Bones and soft tissues:** [ ]

**Visualized upper abdomen:** [ ]

**IMPRESSION:**

- [ ] (include imaging follow-up recommendation)
- .
- .
- .
- Incidental findings for which follow-up may be indicated: [ thyroid nodules, abdominal masses/cysts/ findings, aortic dilatation/aneurysm, infectious/inflammatory/interstitial processes, other (specify) ]

*See reverse for notes and nodule follow-up guidelines*

# Health Factors in EHR → Tracking Tool

ZZTESTPATIENT_DHCP (OUTPATIENT) 15374 Apr 22,16 15:37 Primary Care Team Unassigned 000-00-4321 Feb 02,1950 (66) Current Provider Not Selected	
Last 200 Signed Notes (Total: 2045)	
<ul style="list-style-type: none"> <li>[-] New Note in Progress           <ul style="list-style-type: none"> <li>[-] Apr 22,16 PULMONA</li> </ul> </li> <li>[-] All signed notes           <ul style="list-style-type: none"> <li>[-] Ad Notification And Scree</li> <li>[-] Adhc Progress Note</li> <li>[-] Advance Directive Discus</li> <li>[-] Advance Directive</li> <li>[-] Adverse React/Allergy</li> <li>[-] Anesthesia Crna Progress</li> <li>[-] Ark Pre-Evaluation</li> <li>[-] C&amp;p Examination</li> <li>[-] Cardiology Clinic Staff Not</li> <li>[-] Cboc Annual Visit</li> <li>[-] Cboc Nursing Progress No</li> <li>[-] Cboc Progress Note - Sha</li> <li>[-] Cboc Progress Note-Nw M</li> <li>[-] Cboc Progress Note-Soutl</li> <li>[-] Colon-Rectal Clinic Nursin</li> <li>[-] Colon-Rectal Inpt Staff No</li> <li>[-] Community Health Satisf</li> <li>[-] Consent For Long-Term O</li> <li>[-] Dental Hygiene Progress I</li> <li>[-] Dental Inpt Staff Note</li> <li>[-] Dental Oral Surgery Progr</li> <li>[-] Dental Progress Note</li> <li>[-] Dermatology Clinic Reside</li> <li>[-] Dialysis Nursing Note</li> <li>[-] Ext Surgery Procedure No</li> </ul> </li> </ul>	PULMONARY LUNG CANCER SCREENING Vst: 04/22/16 MSP PULM NPRC LCS FOLLOW UP-X Apr 22,2016@15:37 Subject:
	INITIAL LUNG NODULE documentation. Date of initial image with a lung nodule: Date: April 21, 2016 LDCT Results Highest risk nodule description: Size in mm: 9mm The following incidental findings were noted: Suggestive of lung infection, inflammation, or interstitial process. Comment: tree-in-bud inflammation I am notifying the Primary Care Provider for information, and for follow-up of incidental findings, if indicated. Plan: Interval until next LDCT scan is due: 3 months Comment: CAI 4a Patient Notification of results: Results letter sent to patient. Communicated to Primary Care Provider. (REMEMBER TO ADD THE PCP AS AN ADDITIONAL SIGNER!)
Templates	
<ul style="list-style-type: none"> <li>[-] My Templates           <ul style="list-style-type: none"> <li>[-] LCS LungRADS</li> <li>[-] LCS PCP Notification</li> <li>[-] Lung CA Screening Coordinat</li> <li>[-] Lung Nodule Follow Up</li> <li>[-] Lung Nodule Registry Temple</li> </ul> </li> <li>[-] Shared Templates</li> </ul>	
/ Reminders Encounter New Note	Health Factors: LCS PATIENT NOTIFIED BY LETTER LCS SIZE OF HIGHEST RISK NODULE LCS NEXT CT 3 MONTHS LCS IF ? INFECTION/INTERSTITIAL PROCESS LCS NOTIFIED PCP OF RESULTS

# **National VA LCS Pilot: Preliminary Results**

Initial LCS CT data only, as of March  
2015: pilot ended 9/30/15

# Patient flow in VA LCS DP

- **Of patients being seen in PC clinics, 50% met age criteria.**
- **Of patient meeting age criteria, TPY reminder completed properly 61% of time.**
- **Of patients with properly completed TPY reminders, 32% met smoking criteria, and therefore clinical reminders were turned on.**
- **Of patients with properly completed TPY reminders meeting smoking criteria, PCP assessed patient for screening 28% of the time.**
- **Of patients assessed by PCP, 84% were deemed appropriate for screening with LDCT scans.**
- **Of patients deemed appropriate for LDCT scans, the scans were completed 50% of the time.**

**Note: data from last 6 months of VA LCS DP still are pending.**

# Patient flow in VA LCS DP: areas for improvement

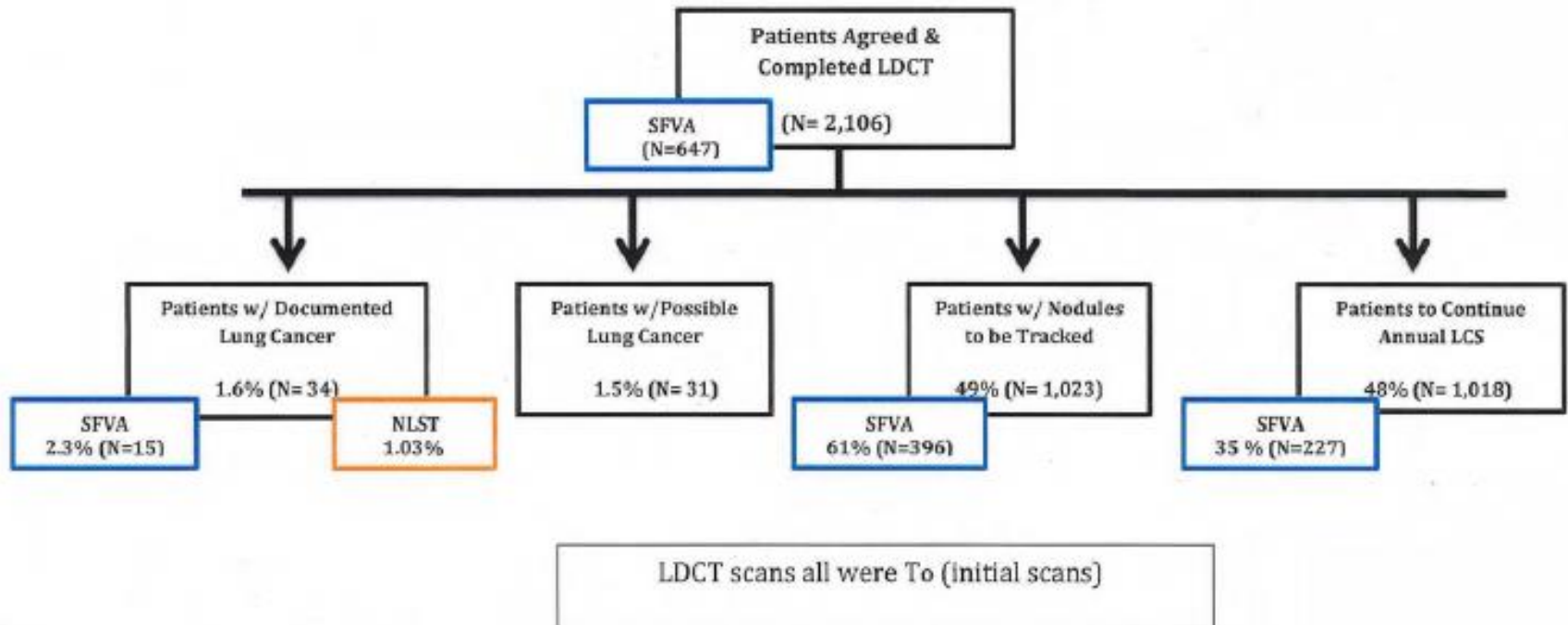
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## VA DEMONSTRATION PROJECT AND SFVAMC LCS RESULTS

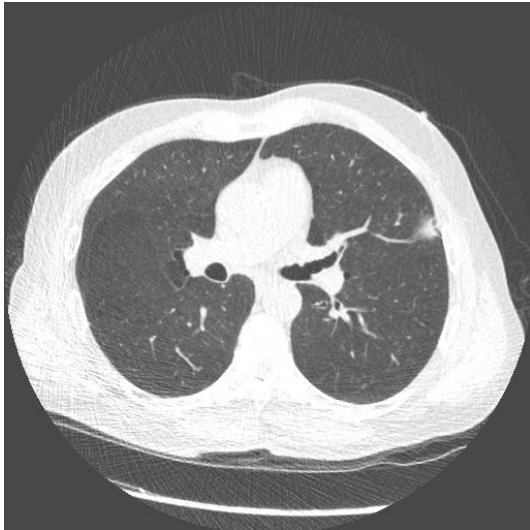
Results for 8-site Demonstration Project as of 3/30/2015

Results for SFVAMC as of 5/10/2016

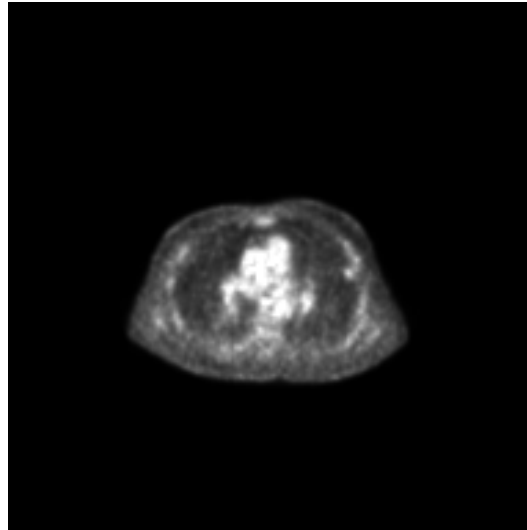


# Screening-detected lung cancer with surgery and histologic confirmation

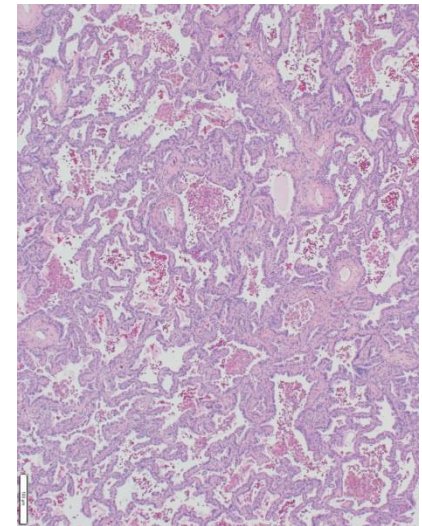
LD CT scan



PET Scan



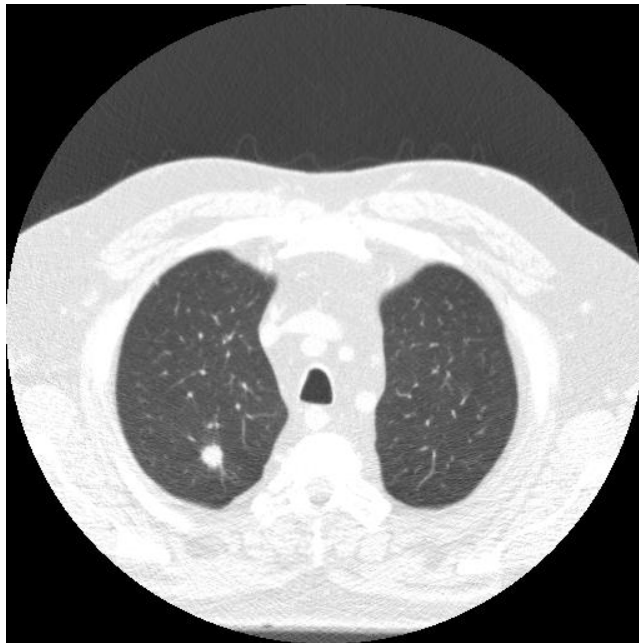
Adenocarcinoma



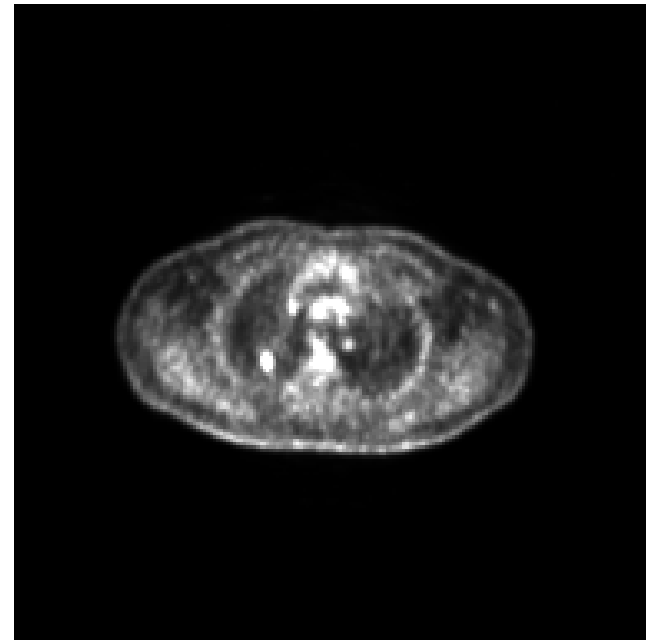


**Highly likely lung cancer (90-95%) but without histologic confirmation, treated with SBRT**

LD CT scan



PET Scan



**Small, low-risk nodules to be tracked: preliminary findings in VA are similar to those of NLST**



**In VA LCS DP, 49% (“2 mm or greater“ but 60 % < 4 mm)**  
**In NLST, 24% (“4 mm or greater” )**

# Complications of invasive procedures in patients with LDCT screening-detected abnormalities

**In NLST, 10% had serious complications from invasive procedures.**

**One possible explanation: no mandated multidisciplinary conference review of high-risk findings in NLST.**

**In VA LCS DP, all high-risk findings were reviewed in multidisciplinary conferences. Final data are pending but it appears that there were much lower complication rates.**

# Questions for VA's Clinical Demonstration Project

- What is the uptake of screening among Veterans and their PCP's ? **Among patients coming to PCP visits, if LCS were offered, 2-4% or less would have screening CT's performed.**
- What are the outcomes in Veterans? **Probably similar to those observed in NLST.**
- Can screening be implemented in the VA with the same level of safety as in NLST? **Yes, possibly with a better level of safety than in NLST.**

# What resources would be needed to offer LCS with LDCT scans more widely in the VA?

1. **IT support for database:** use Portland and/or Minneapolis experiences with their own databases
2. **Multidisciplinary review of high-risk findings:** centralize, and allow designated centers to find ways to offer screening to veterans living in rural area
3. **Adopt efficiencies so that the need for more CT scanners can be minimized:** e.g. use of biennial rather than annual screening in some patients, use of clinical prediction rules
4. **Coordinators at each site:** use training modules developed by Demonstration Project to educate existing nursing staff
5. **Change lung nodule manage algorithms from Fleischner Guidelines to Lung-RADS:** already done at 7 demonstration sites that are continuing to screen.

# Lung Cancer Mortality

