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.
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

<table>
<thead>
<tr>
<th>LungRADS</th>
<th>Patients</th>
<th>Tumor Stage</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>2111</td>
<td>1A and 1B</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>170</td>
<td>IIA and IIB</td>
<td>7</td>
</tr>
<tr>
<td>4A</td>
<td>87</td>
<td>IIIA and IIIB</td>
<td>9</td>
</tr>
<tr>
<td>4B</td>
<td>56</td>
<td>IV</td>
<td>3</td>
</tr>
<tr>
<td>4X</td>
<td>3</td>
<td>Non-lung CA</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unstaged</td>
<td>3</td>
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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*
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.
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

<table>
<thead>
<tr>
<th>Years of Smoking</th>
<th>Pack(s) per day</th>
<th>Pack-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>II</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals:</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Appropriate Follow-Up</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Gender — no. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48 (44)</td>
<td>14 (13)</td>
</tr>
<tr>
<td>Female</td>
<td>41 (37)</td>
<td>7 (9)</td>
</tr>
<tr>
<td>Race — no. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>77 (70)</td>
<td>18 (16)</td>
</tr>
<tr>
<td>Non-caucasian</td>
<td>12 (11)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Education Level — no. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School or Less</td>
<td>31 (28)</td>
<td>15 (14)</td>
</tr>
<tr>
<td>More than High School</td>
<td>58 (53)</td>
<td>6 (5)</td>
</tr>
<tr>
<td>Insurance Status — no. (%)</td>
<td></td>
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<tr>
<td>Medicare</td>
<td>68 (62)</td>
<td>15 (14)</td>
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<tr>
<td>Commercial</td>
<td>21 (19)</td>
<td>6 (5)</td>
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*Using Fisher's exact test of independence, education level was significant at α = 0.05*
Screening Registry Reporting

LUNG CANCER SCREENING
IMPLEMENTATION 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 (l) 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

- Nuance
- Insight
- Invivo
- Primordial
- LungView
- Asper Lung
- PenLung
- LungDirect
- MedMyne
- MedInformatix
- Epic
- LungTrack
- Axis
- Fujifilm
- Siemens Healthineers
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
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