LUNG CANCER SCREENING

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Director, Lung Cancer Screening
Pulmonary and Critical Care Medicine
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DISCLOSURES

• Medical Consultant – Auris Surgical Robotics
• Medical Consultant – Intuitive Surgical Robotics
• Medical Advisory Board – Eolo Medical
• Principle Investigator – Gongwin Biopharm
• Grants:
  • Patient-Centered Outcomes Research Institute (PCORI)
    • Co-Investigator
  • Center for Research to Optimize Precision Lung Cancer Screening in Diverse Populations (PROSPR) – NCI/NIH
    • Co-Investigator
  • Michigan Department of Health and Human Services
    • “Smoking cessation and lung cancer screening”
450 people die every day in the United States due to lung cancer

<table>
<thead>
<tr>
<th>2018 Population</th>
<th>United States</th>
<th>327.2 million</th>
<th>450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>9.996 million</td>
<td>3.1%</td>
<td>14</td>
</tr>
<tr>
<td>Metro Detroit</td>
<td>5.85 million</td>
<td>1.8%</td>
<td>8</td>
</tr>
</tbody>
</table>
FACTS

- Lung cancer is the number one cancer killer of men and women in the US and the World.
- 160,000 lung cancer deaths in the US each year
- Lung cancer kills more Americans than:
  - breast, colorectal, prostate, and pancreas cancers combined.
- More American women die from lung cancer than:
  - breast, uterine, and ovarian cancers combined.
- $36 billion annual productivity lost due to lung cancer
  - Breast cancer - $17 billion
• Lung cancer overall 5 year survival:
  • 1975 12%
  • Currently 15%
• 5-year overall survival:
  • Stage I Asymptomatic - Screened Patients 90%
  • Stage I-II Asymptomatic - Incidental finding 58%
  • Stage IV 1%
• Surgical resection of stage IA disease
  • 5-year survival rates approach 77 - 92%
• 70-75% patients present with stage III and IV disease
  • 5-year survival of less than <1 - 13%
TOBACCO TRENDS

- History of tobacco use
  - The USPSTF estimates 7,000,000 of estimated 90,000,000 smokers fulfill the current screening criteria
  - <20% in 2006

- Higher prevalence
  - Military (1 in 3) vs (1 in 5)
  - Less educated
  - Lower socio-economic status

- Higher risk
  - Rescue workers
  - Occupational exposure

Cigarette smoking has reduced nearly 20% in the past 10 years

2004 - 17.8%
2014 - 16.8%

Michigan population of 9.996 million = 779,688 eligible smokers
Metro Detroit population 5.85 million = 456,300 eligible smokers

The USPSTF estimates 7,000,000 of estimated 90,000,000 smokers fulfill the current screening criteria
LUNG CANCER: NEWLY DIAGNOSED

• Current Smokers: 35%
• Former Smokers: 50%
• Never Smokers: 15%
1. **Primary: Smoking Cessation**
   a. Decrease overall lung cancer deaths
   b. Most people who die from lung cancer are FORMER SMOKERS

2. **Secondary: Lung Cancer Screening**
   a. Find early stage cancer
   b. Decrease mortality, not incidence
HFHS TOBACCO TREATMENT SERVICES

• Certified Tobacco Treatment Specialists offer individual counseling and group classes:
  • Counseling by phone (no travel, extended hours: 8 am-8 pm Mon-Thu, 9 am–4 pm Fri)
  • In-person “Freedom From Smoking” classes
• Free for HAP HMO, AHL and Senior Plus/ Medicare Advantage members and HFHS employees/dependents
• Prescriptions overseen by a Clinical Advisor (HFH pulmonologist)
• Email, texting, acupuncture available
• Quit rates above national average (35-40%)
1968

- Wilson and Junger
- Established principles of screening for World Health Organization
- Requirements of screening studies:
  - Pose little risk to patient
  - Sensitive for detecting disease early in course
  - Give few false positive results
  - Relatively inexpensive

1968
• Northwest London Mass Radiography Service
  • Biannual CXR
  • No difference


1970’s
• Memorial Sloan Kettering (1984)
• Johns Hopkins Study (1984)
• Mayo Lung Project (1986)
• Czechoslovakian Study (1986)
  • CXR - Sputum Cytology
  • No difference screened vs. not

• Melamed et al. Chest 1984
• Tockman, et al. Chest 1986
• Kubik, et al Cancer 1986
HISTORY OF LUNG CANCER SCREENING

• Kaneko et al. (1996)
  • LDCT vs. CXR
  • Suggests LDCT better than CXR
  
  Keneko et al. Radiology 1996

• Sone et al. (1998)
  • LDCT vs. CXR
  • LDCT better than CXR
  

• ELCAP – the Early Lung Cancer Action Project (1999)
  • LDCT vs. CXR
  • More cancer identified with LDCT
  
HISTORY OF LUNG CANCER SCREENING

Annual LDCT

• Germany (2002)
• Japan (2002)
• Italy (2003)
• Lung Screening Study (2004)
• Mayo Clinic LDCT study (2005)

• LDCT annual screening is promising
• No studies powered for survival

• Diederich, et al. Radiology 2002
• Swensen, et al. Radiology 2005
NATIONAL LUNG SCREENING TRIAL (NLST)

- NLST was a NCI and ACRIN sponsored controlled trial
  - 53,000 high-risk subjects randomized to either
  - 3 annual chest radiographs (CXR) or
  - 3 annual low-dose chest CT (LDCT) exams

- Inclusion criteria included:
  - Aged 55-74
  - Current or former smokers (quit within the past 15 years)
  - >30 pack-year smoking history.

The study was halted early (11/2010) due to attainment of 20% mortality benefit goal in LDCT group.
# NLST and STAGE SHIFTING IN LUNG CANCER DIAGNOSIS

<table>
<thead>
<tr>
<th>Stage</th>
<th>Positive Screen</th>
<th>AJCC - NSCLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>63%</td>
<td>24%</td>
</tr>
<tr>
<td>II</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>IIIA /IIIB</td>
<td>8-9%</td>
<td>23%</td>
</tr>
<tr>
<td>IV</td>
<td>13%</td>
<td>44%</td>
</tr>
<tr>
<td>Early Stage (I-II)</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Late Stage (III-IV)</td>
<td>30%</td>
<td>70%</td>
</tr>
</tbody>
</table>
Screening for Lung Cancer:  
US Preventive Services Task Force Recommendation Statement  
December 30, 2013

• Recommendation: The USPSTF recommends annual screening for lung cancer with low-dose computed tomography in adults aged 55 to 80 years who have a 30 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 curative lung surgery.  (B-recommendation)

• B-recommendations from USPSTF qualifies a screening study to be covered by insurance with no deductible
LOW DOSE CT SCANNING

- Multidetector computed tomography (MDCT) resolution allows for dose reduction
- Most LDCT <1mSv / Mammography 0.7mSv
## RADIATION EXPOSURE

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Radiation exposure</th>
<th>Equivalent years of annual lung screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDCT</td>
<td>0.7-0.85 mSv</td>
<td></td>
</tr>
<tr>
<td>Mammogram</td>
<td>.7 mSv</td>
<td></td>
</tr>
<tr>
<td>Lumbar Spine Films</td>
<td>2 mSv</td>
<td>2</td>
</tr>
<tr>
<td>Diagnostic Chest CT</td>
<td>10 mSv</td>
<td>10</td>
</tr>
<tr>
<td>Triphasic CT AB/P</td>
<td>25 mSv</td>
<td>25</td>
</tr>
<tr>
<td>Background Exposure Colorado</td>
<td>3 mSv/year</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4.5 mSv/year</td>
<td>4.5</td>
</tr>
<tr>
<td>Occupational Exposure</td>
<td>50 mSv/year</td>
<td>50</td>
</tr>
<tr>
<td>Transatlantic Flight</td>
<td>.1 mSv</td>
<td></td>
</tr>
</tbody>
</table>

*Larke, et al. AJR 2011*
“Substantial and convincing scientific data show evidence of health effects following high-dose exposures (many multiples of natural background). However, below levels of about 100mSv above background from all sources combined, the observed radiation effects in people are not statistically different form zero,”

Health Physics Society
Adopted: January 1996
Revised: July 2010
Further revised: May 2016
• Fleischner Society Criteria:
  • Used to categorize incidental findings on lung CT scans

• LungRADS (ACR)
  • Purpose: Establish a standardized quality assurance tool to mirror the tool widely utilized in Mammography (BI-RADS)
  • Developed to interpret screening studies of the chest to decrease false positive rate

• Objectives:
  • Standardize terminology
  • Organized reporting and assessment structure
  • Data collection tool to facilitate outcome monitoring
<table>
<thead>
<tr>
<th>Lung Interpretation Categories</th>
<th>Recommended follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 0: Technically inadequate</td>
<td>12mo</td>
</tr>
<tr>
<td>Category 1: Negative</td>
<td>12mo</td>
</tr>
<tr>
<td>Category 2: Benign Appearing/Behaving</td>
<td>12mo</td>
</tr>
<tr>
<td>Category 3: Positive, probably benign</td>
<td>6 mo</td>
</tr>
<tr>
<td>Category 4a: Positive, suspicious</td>
<td>Evaluation/Biopsy</td>
</tr>
<tr>
<td>Category 4b: Positive, more suspicious</td>
<td>Evaluation/Biopsy</td>
</tr>
<tr>
<td>Category C: Previous history of cancer</td>
<td></td>
</tr>
<tr>
<td>Category S: Non-target clinically significant incidental findings</td>
<td></td>
</tr>
</tbody>
</table>
Lung-RADS 4A:
• Suspicious: 5-15% risk of cancer
• New solid nodule 6 mm to <8 mm
• Repeat chest CT in 3 months or get PET/CT if solid component is ≥ 8 mm

Lung-RADS 4B:
• More suspicious: >15% risk of cancer
• New or growing solid nodule ≥ 8 mm
• Obtain PET/CT and/or biopsy.

Immediate evaluation and management of these patients occurs as part of the LCS program
<table>
<thead>
<tr>
<th>Clinical Follow-up (n=1603)</th>
<th>Through May 2014 (JACR publication)</th>
<th>Positive Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative/Benign (LungRADS 1 &amp; 2)</td>
<td>NCCN v1.2012 (~NLST)</td>
</tr>
<tr>
<td></td>
<td>1185</td>
<td>73.9%</td>
</tr>
<tr>
<td></td>
<td>Positive (LungRADS 3&amp;4)</td>
<td>26.1%</td>
</tr>
<tr>
<td></td>
<td>Probablly Benign (LungRADS 3)</td>
<td>352</td>
</tr>
<tr>
<td></td>
<td>Suspicious (LungRADS 4)</td>
<td>66</td>
</tr>
<tr>
<td>Diagnosed lung cancer</td>
<td>29 (1.8%)</td>
<td>29 (1.8%)</td>
</tr>
<tr>
<td>- Positive exam result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Includes 3 cases of presumed malignancy*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Predictive Value</td>
<td>6.9%</td>
<td>17.3%</td>
</tr>
<tr>
<td>Biopsy-proven lung cancer</td>
<td>26 (1.6%)</td>
<td>26 (1.6%)</td>
</tr>
<tr>
<td>- Positive exam result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Excludes 3 cases of presumed malignancy*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Predictive Value</td>
<td>6.2%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>
Lung RADS: ASSESSMENT CATEGORIES

Lung Interpretation Categories

- Category 0: Technically inadequate
- Category 1: Negative
- Category 2: Benign Appearing/Behaving
- Category 3: Positive, probably benign
- Category 4a: Positive, suspicious
- Category 4b: Positive, more suspicious
- Category C: Previous history of cancer
- Category S: Non-target clinically significant incidental findings
LungRADS Category S

- Cardiac
  - Severe coronary calcification
- Aortic aneurysms
  - Ascending and descending
- Tracheal compression – Mass
- Thyroid mass
- Gallstones
- Kidney stones
- Abdominal mass
- Etc.

Currently multiple algorithms for findings
- Assessing automatic referral vs. primary care call
- Patient called by NP to assess urgency when appropriate

Initial Lung Screening Results
Significant Incidental Findings (n=28)
CMS and LUNG CANCER SCREENING

• Initially rejected by CMS but was later accepted with modified patient population:
  • Age 55-77 years (USPSTF recommendation 55-80 years)
  • Asymptomatic (no signs or symptoms of lung disease)
  • Tobacco smoking history of at least 30 pack-years
    • One pack-year = smoking one pack per day for one year;
    • 1 pack = 20 cigarettes
  • Current smoker or one who has quit smoking within the last 15 years; and
• All patients uploaded to national database (ACR)
• ACR Designated Lung Cancer Screening Designation:
  • Recommended screening population
  • Personnel qualifications (radiologists, technicians, etc.)
  • Follow up system in place for patient findings
  • Smoking cessation program
  • All CT scanners must be inspected and certified
  • Quality control measures in place
• Appropriate imaging protocol:
  • ACR-STR practice guideline specifications for CT lung screening
• A joint decision making session
First covered service (CMS) that requires Joint Decision Making

Joint decision making visit: G codes: G0296 and G0297

- G0296 — Counseling visit to discuss need for lung cancer screening using low-dose CT scan (service is for eligibility determination and shared decision making)
- G0297 — Low-dose CT scan for lung cancer screening (imaging claim billed by radiology)

Medicare will deny G0296 and G0297 for claims that do not contain ICD-9 code V15.82 / ICD-10 code Z87.891: personal history of tobacco use/personal history of nicotine dependence
Joint Decision Making Visit Requirements:

- Must be completed by a physician (as defined in section 1861(r)(1) of the Act) or qualified non-physician practitioner (meaning a Physician Assistant (PA), Nurse Practitioner (NP), or Clinical Nurse Specialist (CNS) as defined in section 1861(aa)(5) of the Act); and

- Must include all of the following elements:
  - Determination of beneficiary eligibility including age
  - No signs or symptoms of lung cancer
  - A specific calculation of cigarette smoking pack-years (in note)
  - If a former smoker, the number of years since quitting;
Requirements Continued:

• The use of one or more decision aids, to include: benefits and harms of screening, follow-up diagnostic testing, over-diagnosis, false positive rate, and total radiation exposure

• Counseling on the importance of adherence to annual lung cancer LDCT screening, impact of co-morbidities, and ability or willingness to undergo diagnosis and treatment

• Counseling on the importance of maintaining cigarette smoking abstinence if former smoker; or the importance of smoking cessation if current smoker and, if appropriate, furnishing of information about tobacco cessation interventions

• If appropriate, order for lung cancer screening with LDCT
<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
<th>Professional Component</th>
<th>Global Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling visit to discuss need for lung cancer screening (LDCT) using low-dose CT scan</td>
<td>G0296</td>
<td>$28.64</td>
<td>$28.64</td>
</tr>
<tr>
<td>Low-dose CT scan (LDCT) for lung cancer screening</td>
<td>G0297</td>
<td>$51.56</td>
<td>$254.93</td>
</tr>
</tbody>
</table>
LUNG CANCER SCREENING AT HFH

• First meeting 2011
• Initial cost $350 (2011)
• Cost changed to $99 (last quarter 2013)
• Meetings with Macomb / Wyandotte / West Bloomfield Spring 2014

**Screening Numbers**

2011: 3
2012: 12
2013: 28 (last quarter 22)
2014: 569 (in response to marketing of $99 scans)
2015: 222
LUNG CANCER SCREENING AT HFH

• Fall 2016
  • LCS ROI submitted
  • 754 Scans
• Spring 2017:
  • 2 APPs hired and began training
• Summer 2017:
  • APP began regional JDM clinics
• Fall 2017:
  • Nurse Coordinator hired
• Fall 2017:
  • LCS officially became part of PCCM under Department of Internal Medicine

• November 2017:
  • Saugrich named Lead Administrator, LCS
• November 2017:
  • Simoff named Director, LCS
• 2017: 1431 Scans
• January 2018:
  • Simoff and Saugrich operationally running LCS
• February 2018:
  • LCS office opened K17, Main Campus
EPIC QUERY FOR PATIENTS QUALIFYING FOR LCS

- Epic data for 55-80yo, 2012-2017
- Based on last visit with primary care visit recorded:
  - 16,610 Current smokers 55-80
    - 20% eligible
    - 28% not eligible for screening (<30 pack years)
    - 52% unknown as there are no pack years listed
  - 43,041 Former smokers 55-80
    - 5.9% eligible
    - 25.9% not eligible
    - 68% cannot determine eligibility because either pack years or quit date or both are missing
- 61,484 Never smokers also captured in the same time period.

Overall – we cannot determine eligibility for 63.6% of 55-80 year olds who are current or former smokers by queries of data in Clarity
Where do patients come from:

- Cold Call
- Patients identified in Clarity search of Epic data
- Performed by Pulmonary MA
- Direct call by patients
- Marketing campaign (mailing)
- E-mail requests
  - Faxed to LCS office (private MD)
- Radiology work queue

LUNG CANCER SCREENING AT HFH

Due to findings of project, all screening studies ordered on Epic go to the appropriate radiology work queue (Main, Macomb, Wyandotte, West Bloomfield) and then those lists are sent to LCS Nurse Coordinator for processing through program.
WHAT IS THE PURPOSE OF THE HFH LUNG CANCER SCREENING PROGRAM

- This program is an attempt to centralize and standardize lung cancer screening across the entire health system
- To incorporate smoking cessation for all eligible patients
- The LCS program is integrating central evaluation with local management
- To provide screenings and follow up clinics with appropriate referrals
- To ensure all candidates are screened and all patients screened receive the appropriate follow-up
Mission:
• Through our knowledge, experience, and compassion, we will use those tools available to us to influence the outcome of lung cancer.

Vision:
• We will work toward giving every patient at risk, the opportunity of early diagnosis and the hope of a cure.
LUNG CANCER SCREENING TEAM

Clinical Team
- Shannon Neumann, MSN, ANP-BC
  - Nurse Practitioner
- Amanda Less, CNP
  - Nurse Practitioner
- Lynda Karnib, CNP
  - Nurse Practitioner
- Cindy Lambdin, RN, MS
  - Nurse Coordinator
- Brenda Kieswetter, RN, MSN
  - Nurse Coordinator
- Lizabeth Webster, RN, BSN
  - Follow Up Nurse Coordinator
- Kimberly Csapo, RN, BSN
  - Follow Up Nurse Coordinator
- Sharron McDougall-Dey
  - Administrative Assistant
- Elizabeth Kozmor
  - Clinic Service Representative

Leadership Team
- Michael Simoff, MD
  - Medical Director
- Lana Saugrich, RN, BSN
  - Manager, LCS
- Rolando Peralta, MD
  - Associate Director

Research Team
- Michael Simoff, MD
  - Medical Director
- Christine Neslund-Dudas, PhD
  - Lead Scientist, LCS
- Elizabeth Alleman, MPH
  - Epidemiologist II, LCS
- Amanda Holm, MPH
  - Project Manager CTTS
- Michael Sheehan, RHIT
  - Database/Programmer LCS
LCS PROCESS

Daily patient intake:
- Email: radiology work queues
- Main, Fairlane, Wyandotte, West Bloomfield, & Macomb
- Data re-entered manually into operational database by nurse coordinator
- Email forms: HFH physicians without Epic
- Phone calls from patients
- LCSP Web Email from patients
- All charts reviewed as to candidacy by nurse coordinator
- Order placed by nurse coordinator for JDM
  - (Average time for nurse coordinator 20 min/patient)
- Candidates called, history confirmed by MA, scheduled for JDM at appropriate location

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• JDM and CT ordered by APPs
• Prior authorization sent to Central Authorization
  • Average turn around 2 weeks
• When authorization confirmed, CT scheduled by NP
<table>
<thead>
<tr>
<th>Region</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>44 appts/week</td>
<td>10am/10:30a/11am</td>
<td>10am/10:30am</td>
<td>10:30am/12:30</td>
<td>LCS Team Meeting</td>
</tr>
<tr>
<td>West</td>
<td>40 appts/week</td>
<td>10am/10:30am</td>
<td>10:30am/12:30</td>
<td>10:30am</td>
<td></td>
</tr>
</tbody>
</table>

**Planned expansion of program:**
- Sterling Heights Medical Center
- Allegiance Hospital (Merge active program)
- (Garden City Hospital – Meeting with CEO)
• Patients arrive for JDM (group sessions)
• NP gives PowerPoint presentation to patients, addresses and answers all questions
• As group and individually on request

LCS PROCESS

• APP escorts patients to CT and Patients are scanned
• JDM note uploaded to EPIC
• Findings reviewed by APP
• All 3, 4’s, and significant S scans reviewed with LCS physician
SMOKING CESSATION

- Smoking cessation became part of the JDM presentation - 2018
- Nurse practitioners will become certified smoking cessation consultants

<table>
<thead>
<tr>
<th>Year</th>
<th>cTTS referrals HFH</th>
<th>cTTS referrals LCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>1213</td>
<td>36</td>
</tr>
<tr>
<td>2018</td>
<td>2253</td>
<td>929</td>
</tr>
</tbody>
</table>

- 645% Increase in cTTS referrals in 1 year
- 41% of all cTTS referrals in 2018
**LungRADs 1, 2 or 3**

- Letter generated and sent with recommended follow-up
  - To patient
  - To primary care physician
  - Epic or mail
- Patient entered into database to ensure follow-up study ordered
- Follow-up study completion is monitored
- If patient does not arrive for scheduled appointment contacted by LCS team member

**LungRADS 4a, 4b or 4x**

- Case automatically reviewed by LCS Physician
- All cases reviewed weekly at LCS meeting
- If highly suspicious, primary care contacted by phone, PET scan ordered by LCS-APP or PMD (when indicated)
- Primary care / local pulmonologist sees patient in one week (monitored by LCS) or
- Clinic appointment scheduled with IP or thoracic surgery depending on findings
- When LCS managed suspicious nodule: average time from highly suspicious lesion to therapy
  - 3 weeks
S-Modifier positive
• Patient called if concerned regarding findings
• Automatic: Cardiology, vascular surgery, thoracic surgery reviews for suspicious findings
• Primary care physician alerted

• Referrals are sent to primary care referring physicians
  • i.e. at Macomb, each private practice group receives appropriate patients from primary care physicians
• This process is being evaluated
• Concern with over referral
• 7,155 referred for screening between
• 4,834 completed a baseline CT
  • Still assessing annual screen compliance (different/erroneous CPT codes have been used by ordering physicians overtime and clean-up is in progress)
• 391 patients required follow-up at 6 months or less
• 132 individuals with a PET scan
• 24 bronchoscopies / 21 patients
• 41 non-surgical biopsies
• 64 cancer cases
• 42 resections
<table>
<thead>
<tr>
<th>Year</th>
<th>Orders</th>
<th>Screening CT Complete</th>
<th>≤ 6 months of follow-up recommended</th>
<th>PET Scan</th>
<th>Bronchoscopies performed</th>
<th>Non-surgical Biopsy</th>
<th>Cancer Cases</th>
<th>Resection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>13</td>
<td>12</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2013</td>
<td>46</td>
<td>28</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>773</td>
<td>569</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
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<tr>
<td>2015</td>
<td>385</td>
<td>222</td>
<td>12</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>1,257</td>
<td>754</td>
<td>68</td>
<td>18</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>2017</td>
<td>2,121</td>
<td>1,431</td>
<td>161</td>
<td>73</td>
<td>8</td>
<td>18</td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td>2018*</td>
<td>2,557</td>
<td>1,755</td>
<td>136</td>
<td>56**</td>
<td>11**</td>
<td>17**</td>
<td>32</td>
<td>13**</td>
</tr>
<tr>
<td>Total</td>
<td>7,155</td>
<td>4,774</td>
<td>391</td>
<td>132</td>
<td>24</td>
<td>41</td>
<td>73</td>
<td>42</td>
</tr>
</tbody>
</table>

* Follow-up time has not reached six months for cases in later half of 2018 (1 Probable, 62 to be determined)
** Updated numbers not complete for last 9 cancers identified, last half of 2018
Number of Patients Referred to Lung Cancer Screening by Quarter of Original Order and Completion Status (n=7,155)
### Attendance at 2018 Joint Decision Making (JDM) Sessions by Location

Number of no-show patients represented in parentheses.

<table>
<thead>
<tr>
<th>Location</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownstown</td>
<td>0 (0)</td>
<td>21 (2)</td>
<td>21 (3)</td>
<td>19 (5)</td>
<td>6 (4)</td>
<td>14 (0)</td>
<td>26 (2)</td>
<td>22 (2)</td>
<td>19 (3)</td>
<td>16 (2)</td>
<td>8 (2)</td>
<td>16 (0)</td>
<td>188 (25)</td>
</tr>
<tr>
<td>Cottage</td>
<td>3 (0)</td>
<td>7 (3)</td>
<td>10 (3)</td>
<td>10 (4)</td>
<td>12 (0)</td>
<td>0 (0)</td>
<td>6 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>48 (10)</td>
</tr>
<tr>
<td>Fairlane</td>
<td>24 (5)</td>
<td>31 (2)</td>
<td>34 (7)</td>
<td>30 (4)</td>
<td>23 (4)</td>
<td>23 (3)</td>
<td>18 (6)</td>
<td>44 (8)</td>
<td>32 (7)</td>
<td>39 (8)</td>
<td>23 (8)</td>
<td>8 (8)</td>
<td>329 (70)</td>
</tr>
<tr>
<td>Henry Ford Main</td>
<td>6 (7)</td>
<td>12 (1)</td>
<td>25 (2)</td>
<td>18 (5)</td>
<td>23 (4)</td>
<td>12 (4)</td>
<td>17 (6)</td>
<td>29 (11)</td>
<td>19 (8)</td>
<td>20 (6)</td>
<td>19 (5)</td>
<td>16 (16)</td>
<td>216 (75)</td>
</tr>
<tr>
<td>Macomb</td>
<td>23 (3)</td>
<td>55 (9)</td>
<td>43 (15)</td>
<td>56 (4)</td>
<td>54 (6)</td>
<td>35 (8)</td>
<td>49 (9)</td>
<td>72 (11)</td>
<td>49 (11)</td>
<td>79 (18)</td>
<td>42 (10)</td>
<td>41 (14)</td>
<td>598 (118)</td>
</tr>
<tr>
<td>West Bloomfield</td>
<td>0 (1)</td>
<td>0 (6)</td>
<td>24 (8)</td>
<td>23 (5)</td>
<td>18 (7)</td>
<td>26 (1)</td>
<td>28 (5)</td>
<td>27 (2)</td>
<td>18 (4)</td>
<td>23 (4)</td>
<td>18 (1)</td>
<td>29 (8)</td>
<td>234 (52)</td>
</tr>
<tr>
<td>Wyandotte</td>
<td>21 (0)</td>
<td>18 (0)</td>
<td>29 (1)</td>
<td>31 (1)</td>
<td>22 (3)</td>
<td>20 (4)</td>
<td>41 (5)</td>
<td>43 (1)</td>
<td>26 (3)</td>
<td>25 (4)</td>
<td>38 (3)</td>
<td>19 (2)</td>
<td>333 (27)</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>77 (16)</td>
<td>144 (23)</td>
<td>186 (39)</td>
<td>187 (28)</td>
<td>158 (28)</td>
<td>130 (20)</td>
<td>185 (33)</td>
<td>237 (35)</td>
<td>163 (36)</td>
<td>202 (42)</td>
<td>148 (29)</td>
<td>129 (48)</td>
<td>1,946 (377)</td>
</tr>
</tbody>
</table>
### JDM No-Show Rates

<table>
<thead>
<tr>
<th>Location</th>
<th>Total</th>
<th>No-Show Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownstown</td>
<td>188 (25)</td>
<td>13%</td>
</tr>
<tr>
<td>Cottage</td>
<td>48 (10)</td>
<td>21%</td>
</tr>
<tr>
<td>Fairlane</td>
<td>329 (70)</td>
<td>21%</td>
</tr>
<tr>
<td>Henry Ford Main</td>
<td>216 (75)</td>
<td>35%</td>
</tr>
<tr>
<td>Macomb</td>
<td>598 (118)</td>
<td>20%</td>
</tr>
<tr>
<td>West Bloomfield</td>
<td>234 (52)</td>
<td>22%</td>
</tr>
<tr>
<td>Wyandotte</td>
<td>333 (27)</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>1,946 (377)</strong></td>
<td><strong>19%</strong></td>
</tr>
</tbody>
</table>

Population with highest no-show rate is white smokers

---

Focus Groups

*WE'RE HAVING A FOCUS GROUP TO TEST WHICH QUESTIONS TO ASK IN OUR NEXT FOCUS GROUP.*
### Lung-RADS Results by Category and Year, 2015-2018

<table>
<thead>
<tr>
<th>Lung-RADS</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
<th>Percent of Total</th>
<th>NLST</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0.1%</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>27</td>
<td>149</td>
<td>442</td>
<td>641</td>
<td>1,259</td>
<td>30.3%</td>
<td>55.6%</td>
</tr>
<tr>
<td>2</td>
<td>86</td>
<td>475</td>
<td>780</td>
<td>823</td>
<td>2,164</td>
<td>52.0%</td>
<td>30.8%</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>49</td>
<td>95</td>
<td>133</td>
<td>288</td>
<td>82.3%</td>
<td>86.4%</td>
</tr>
<tr>
<td>4A</td>
<td>6</td>
<td>29</td>
<td>57</td>
<td>76</td>
<td>168</td>
<td>4.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>4B</td>
<td>0</td>
<td>15</td>
<td>33</td>
<td>39</td>
<td>87</td>
<td>2.1%</td>
<td>1.4%</td>
</tr>
<tr>
<td>4X</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>19</td>
<td>25</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Fleischner</td>
<td>62</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>63</td>
<td>1.5%</td>
<td>-</td>
</tr>
<tr>
<td>Unknown</td>
<td>28</td>
<td>38</td>
<td>18</td>
<td>18</td>
<td>102</td>
<td>2.5%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Total</td>
<td>222</td>
<td>756</td>
<td>1,433</td>
<td>1,750</td>
<td>4,161</td>
<td>100.0%</td>
<td>-</td>
</tr>
</tbody>
</table>
## Lung Cancer Cases

n=73 (n=55 staged)

<table>
<thead>
<tr>
<th>Stage</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>24 (43.6)</td>
</tr>
<tr>
<td>Stage II</td>
<td>10 (18.2)</td>
</tr>
<tr>
<td>Stage III</td>
<td>13 (23.6)</td>
</tr>
<tr>
<td>Stage IV</td>
<td>8 (14.5)</td>
</tr>
<tr>
<td>Stage not extracted to date</td>
<td>18</td>
</tr>
</tbody>
</table>

61.8% Early Stage
# Number Needed to Screen

**NNS**

[Patients screened to prevent one cancer death]:

<table>
<thead>
<tr>
<th>Cancer</th>
<th>NNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>320</td>
</tr>
<tr>
<td>Breast</td>
<td>233-746 (various subgroups)</td>
</tr>
<tr>
<td>Colorectal</td>
<td>1176</td>
</tr>
<tr>
<td>Prostate (PSA)</td>
<td>1254</td>
</tr>
</tbody>
</table>

**HFH NNS LCS:**

- Overall: 65
- 2018: 55
<table>
<thead>
<tr>
<th>Finding</th>
<th>Count</th>
<th>Percent of All S Modifiers</th>
<th>Percent of Patients with S Modifiers</th>
<th>Percent of All Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n=2,057</td>
<td>n=1,558</td>
<td>n=5,728</td>
</tr>
<tr>
<td>Aortic Aneurysm</td>
<td>171</td>
<td>8.3%</td>
<td>11.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Mild</td>
<td>85</td>
<td>49.7%</td>
<td>5.7%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Moderate</td>
<td>12</td>
<td>7.0%</td>
<td>0.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Severe</td>
<td>10</td>
<td>5.8%</td>
<td>0.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Unknown</td>
<td>64</td>
<td>37.4%</td>
<td>4.3%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Coronary Arterial Calcification</td>
<td>881</td>
<td>42.8%</td>
<td>59.2%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Mild</td>
<td>34</td>
<td>3.9%</td>
<td>2.3%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Moderate</td>
<td>182</td>
<td>20.7%</td>
<td>12.2%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Severe</td>
<td>293</td>
<td>33.3%</td>
<td>19.7%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Unknown</td>
<td>372</td>
<td>42.2%</td>
<td>25.0%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Pulmonary Fibrosis</td>
<td>3</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Other ILD</td>
<td>121</td>
<td>5.9%</td>
<td>8.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Unknown</td>
<td>38</td>
<td>1.8%</td>
<td>2.6%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>
## S Modifier Findings, 2014 – 2018 (cont.)

<table>
<thead>
<tr>
<th>Finding</th>
<th>Count</th>
<th>Percent of All S Modifiers</th>
<th>Percent of Patients with S Modifiers</th>
<th>Percent of All Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td></td>
<td>n=2,057</td>
<td>n=1,558</td>
<td>n=5,728</td>
</tr>
<tr>
<td>Adrenal</td>
<td>187</td>
<td>9.1%</td>
<td>12.6%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Axillary</td>
<td>22</td>
<td>11.8%</td>
<td>1.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Breast</td>
<td>11</td>
<td>5.9%</td>
<td>0.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Kidney</td>
<td>13</td>
<td>7.0%</td>
<td>0.9%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Mediastinum</td>
<td>23</td>
<td>12.3%</td>
<td>1.5%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Neck</td>
<td>3</td>
<td>1.6%</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Thyroid</td>
<td>25</td>
<td>13.4%</td>
<td>1.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Liver</td>
<td>11</td>
<td>5.9%</td>
<td>0.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Other</td>
<td>41</td>
<td>21.9%</td>
<td>2.8%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

2018: 6 Other cancers diagnosed from S-modifiers identified
- Lymphoma
- Lymphoproliferative disorder, NOS
- Hepatocellular carcinoma
- Breast - Infiltrating ductal carcinoma
- Renal cell carcinoma
- Adenocarcinoma of undetermined primary
<table>
<thead>
<tr>
<th>Finding</th>
<th>Count</th>
<th>Percent of All S Modifiers</th>
<th>Percent of Patients with S Modifiers</th>
<th>Percent of All Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Clinically Significant Abnormality</td>
<td>656</td>
<td>31.9%</td>
<td>44.1%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Ascites</td>
<td>2</td>
<td>0.3%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Breast</td>
<td>12</td>
<td>1.8%</td>
<td>0.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>34</td>
<td>5.2%</td>
<td>2.3%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>26</td>
<td>4.0%</td>
<td>1.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Heart</td>
<td>51</td>
<td>7.8%</td>
<td>3.4%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Liver</td>
<td>95</td>
<td>14.5%</td>
<td>6.4%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Kidney</td>
<td>30</td>
<td>4.6%</td>
<td>2.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Lung</td>
<td>314</td>
<td>47.9%</td>
<td>21.1%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Spleen</td>
<td>14</td>
<td>2.1%</td>
<td>0.9%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Vertebra</td>
<td>12</td>
<td>1.8%</td>
<td>0.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Other</td>
<td>66</td>
<td>10.1%</td>
<td>4.4%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>
## LUNG CANCER SCREENING ADHERENCE

<table>
<thead>
<tr>
<th></th>
<th>CT Complete</th>
<th>No CT Following Referral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2088 (69.3)</td>
<td>1776 (73.6)</td>
<td>3864 (71.2)</td>
</tr>
<tr>
<td>Black</td>
<td>561 (18.6)</td>
<td>396 (16.4)</td>
<td>957 (17.6)</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>364 (12.1)</td>
<td>242 (10.0)</td>
<td>606 (11.2)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1403 (46.6)</td>
<td>1158 (48.0)</td>
<td>2561 (47.2)</td>
</tr>
<tr>
<td>Male</td>
<td>1610 (53.4)</td>
<td>1255 (52.0)</td>
<td>2865 (52.8)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 55</td>
<td>44 (1.5)</td>
<td>114 (4.7)</td>
<td>158 (2.9)</td>
</tr>
<tr>
<td>55-64</td>
<td>1674 (55.6)</td>
<td>1299 (53.8)</td>
<td>2973 (54.8)</td>
</tr>
<tr>
<td>65-79</td>
<td>1285 (42.6)</td>
<td>971 (40.2)</td>
<td>2256 (41.6)</td>
</tr>
<tr>
<td>80+</td>
<td>10 (0.3%)</td>
<td>29 (1.2)</td>
<td>39 (0.7)</td>
</tr>
<tr>
<td>Median Income</td>
<td>$65,200</td>
<td>$59,972</td>
<td>$64,599</td>
</tr>
</tbody>
</table>
Fall 2017, we began conducting focus groups to learn how to better serve our patients from their direct experiences.

**Goal:** To determine differences between patients that are adherent to lung cancer screening and those that do not complete a screening CT

**Sub-Goal:** Determine whether patients referred directly to lung cancer screening by a physician receive/report similar knowledge regarding lung cancer screening as patients attending LCSP session
Public Health Sciences and Global Health Initiative

- Population-based Research Optimizing Screening through Personalized Regiments (PROSPR)
  - $2.4 million – 5 year funding – Multicenter grant - NIH/NCI (LCS Section)
- Lung Cancer Screening and Tobacco Cessation
- State of Michigan Department of Health
- Treating Tobacco Dependence in Macedonia
  - $250,000 – Pfizer Global Health Fellows Program
- Lung Cancer Informatics of Screening (LuCIS)
  - $174,864 – NCI
- NCI – Cancer Research Network – Lung Cancer Screening
- Patient Centered Outcomes Research Institute (PCORI)
  - $3.3 million – 5 years funding Multicenter grant
- Disparities SPORE – NIH – Application under review (LCS portion)
• Nearly 20% of patients referred for screening are African American

• We believe we are on or near the appropriate percent of African Americans being referred based on the current US Preventive Services Criteria and Medicare criteria

• This said, current criteria for screening do not fit the risk of lung cancer in African Americans versus whites

• African Americans are known to have higher risk for lung cancer with lower pack-years of smoking – particularly in moderate smokers (less than 1 pack per day)


• Additionally, the time delay for African Americans (referral to screening) is double that of whites.

• Although this may not be a clinically significant gap – it still indicates a gap in access for our African American patients and we are working on reducing this gap.
- Order LCS in Epic
- This is a referral to the LCS program
- All orders for LCS screening studies are forwarded to LCS Program
- Health maintenance flags in Epic developed
  - “Lung Cancer Screening” modifier (flag)
  - Currently manual as the smoking history is not reliably accurate or complete
Personnel

• Nurse practitioners
  • JDM Clinics
  • Clinical follow-up
  • Nodule clinics (planned)

• Nurse Coordinators
  • Prescreen
  • Organize testing
  • Ensure follow-up
  • Coordinate team operations

• Follow-up nurse coordinators
  • Ensure patients studies are scheduled and completed
  • Follow-up on findings

• Clinic Service Representative
  • Scheduling of all studies
  • Patient to call for questions

Database

• We have created a REDCap database to monitor results
• Used to download data required for ACR database
• Use Research Abstract Analysts for chart extraction
• Looking at commercial systems that have links to EPIC

Coding

• G0296 JDM
• G0297 Initial screen
• G6526 Subsequent annual screen
• Goal to have new code for 3 and 6 month re-scans needed for category III and IV results
  • Standard CT, ordering to improve monitoring
QUALITY IMPROVEMENT

• System wide quality assurance projects to assess understanding, ordering, results of lung cancer screening
  • Survey of primary care physicians:
  • Knowledge and understanding of LCS and smoking cessation
  • Goal to create education model as part of yearly HFH University
1. Joint Decision Making (JDM) visit:
   • LCS arranges appointments and sends all reminder letters
   • Patients are educated on the risks and benefits of lung cancer screenings
   • Patients are educated on Smoking cessation and given referrals to the smoking cessation program if requested.
   • Documented in EPIC

2. LDCT Screening (completed on same day as JDM):
   • Orders placed by LCSP APPs
   • LCS obtains prior authorization for imaging when needed
   • Result letter sent to patient within 24-48 hours
   • All future rescans are followed by LCS
3. Lung-RADs 4A/B and incidental findings:
   • Established collaboration with specialties (IP, thoracic surgery, medical oncology, rad oncology) for quicker follow up and smooth transition.
   • PCPs are copied on all results

4. Lung-RAD S findings:
   • Significant findings
   • Patients contacted to evaluate by phone for symptoms
   • Appropriate referral scheduled
   • When urgent, LCS physician to specialist direct communication
   • Other Findings – Communicated directly with PCP

5. Smoking cessation discussed and referrals made for all smokers

6. Potential to expedite diagnostic and therapeutic care
ONGOING PROCESS

• Simoff / Neslund-Dudas: NIH and State of Michigan funded research on LCS and smoking cessation (MDHHS, PICORI, PROSPR)

• Three new APPs hired and being trained

• New Follow-up nurse position created and staffed

• Focus groups ongoing to find out why people are missing appointments/follow-ups

• Looking at available commercial database systems

• Ongoing ACR uploads

• Strategic planning: 4 current choke points identified, work around being addressed (manual download of radiology orders, time for CT authorization, repetitive hard stops in Epic scheduling system, lack of personnel)

• Development of East and West lung nodule clinics

• Broaden potential candidates for screening:
  • NCCN Group 2, lung cancer patients post therapy, expanded age as suggested by USPSTF, African Americans (<55yo), >30 pack year smokers <55yo,
CONCLUDING REMARKS

• 450 Americans die per day due to lung cancer
  • Lung cancer screening can begin to reduce this number
• Screening is based on excellent data
• Primary care physicians do not have the time to perform actual JDM
• Research needs to be supported for further evaluation of:
  • Additional high-risk populations
  • The use of concurrent liquid or exhaled markers of risk
  • How to maximize integration and follow-up
  • The influence of S-modifiers to further evaluation and management of patients
• Education of the entire medical community is needed
• Screening must be developed as a system-wide program or a centralized structure needs to be constructed at regional or the state level to manage LCS programs
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<tr>
<th><strong>Clinical Team</strong></th>
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**Thank You!**
Questions?

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