Outline

• Screening; Some simple but necessary truths
• Do people benefit from screening?
• What are the harms (and are they outweighed by benefits)?
• Can it be done in a cost effective manner?
Which of these establishes the efficacy of a screening test?

- Test detects more cancers than control group
- Longer 5 yr survival in test vs. controls
- Fewer tested patients die of the disease than controls

Outline

- Screening background
  - (Some simple obvious truths about screening)
- Do people benefit from screening?
- What are the harms (and are they outweighed by benefits)?
- Can it be done in a cost effective manner?
How did we get here?

• Summary of CXR screening trials
• Three NCI screening trials in 1970s
  – > 30,000 subjects
  – CXR detected more cases (Length Bias)
  – More early stage disease (Length and Lead time Bias)
  – Improved survival in the screened group (Length and Lead time bias)
  – No difference in mortality (Overdiagnosis?)

• Q: How many compared CXR screening to no screening?
NLST study design

• Study design
  - 50,000 healthy current or former (15 yrs), heavy (30 pk-yr) smokers, age 55-74
  - Yearly CXR or CT at 0, 1, and 2 years
  - 2002-2008, with follow up through 2011

• 90% power to detect 20% mortality benefit
  - All cause mortality, Prevalence, incidence, interval cancers, PPV, NPV, Stage distribution
  - HRQOL, and Anxiety instrument
  - Medical resource utilization for positive screen and cost effectiveness
## Cumulative Deaths from Lung Cancer

**Death from Lung Cancer**

<table>
<thead>
<tr>
<th>Benefit: How did CT scans help compared to chest X-ray, an ineffective screening test?</th>
<th>Low-dose CT 26,722 people</th>
<th>Chest X-ray 26,732 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in 1,000 fewer <strong>died from lung cancer</strong></td>
<td>18 in 1,000</td>
<td><strong>versus</strong> 21 in 1,000</td>
</tr>
<tr>
<td>5 in 1,000 fewer <strong>died from all causes</strong></td>
<td>70 in 1,000</td>
<td><strong>versus</strong> 75 in 1,000</td>
</tr>
</tbody>
</table>

**Harm: What problems did CT scans cause compared to chest X-ray?**

<table>
<thead>
<tr>
<th></th>
<th>Low-dose CT 365 in 1,000</th>
<th>Chest X-ray 142 in 1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>223 in 1,000 more had at least one <strong>false alarm</strong></td>
<td>365 in 1,000</td>
<td><strong>versus</strong> 142 in 1,000</td>
</tr>
<tr>
<td>18 in 1,000 more had a <strong>false alarm leading to an invasive procedure</strong>, such as bronchoscopy, biopsy, or surgery</td>
<td>25 in 1,000</td>
<td><strong>versus</strong> 7 in 1,000</td>
</tr>
<tr>
<td>2 in 1,000 more had a <strong>major complication</strong> from Invasive procedures</td>
<td>3 in 1,000</td>
<td><strong>versus</strong> 1 in 1,000</td>
</tr>
</tbody>
</table>

Where we are now

USPSTF recommends **annual** screening for lung cancer with low-dose computed tomography (LDCT) in persons at high risk for lung cancer based on age (55-80) and smoking history (>30 pk-yrs, within 15 yrs)

LDCT Screening in asymptomatic high risk persons can reduce disease specific mortality by 20%.

But 20% reduction in mortality isn’t very high, is it?

How does this compare to other cancer screening strategies?
<table>
<thead>
<tr>
<th>Intervention</th>
<th>Age</th>
<th>Screen frequency</th>
<th>RR of death</th>
<th>Baseline risk of death</th>
<th>NNS</th>
<th>$/QALY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERSPEC¹</td>
<td>55-69</td>
<td>q 2-7 years</td>
<td>0.80 (0.65-0.98)</td>
<td>0.4%</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>PLCO ²</td>
<td>55-74</td>
<td>Yearly X 6y</td>
<td>1.10 (0.80-1.50)</td>
<td>0.1%</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Mammography³,⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39-49</td>
<td>Yearly X 2-9y</td>
<td>0.85 (0.75-0.96)</td>
<td>0.3%</td>
<td>1,900</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-59</td>
<td>Yearly X 10</td>
<td>0.86 (0.75-0.99)</td>
<td>0.5%</td>
<td>1,300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>Yearly X 10</td>
<td>0.68 (0.54-0.87)</td>
<td>0.8%</td>
<td>380</td>
<td>$58,000 ⁵</td>
</tr>
<tr>
<td>Colon cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fecal occult blood³</td>
<td>~ 9 years</td>
<td></td>
<td>0.77</td>
<td>??</td>
<td>808</td>
<td></td>
</tr>
<tr>
<td>Flex Sig/FOB ⁶</td>
<td>50</td>
<td>q 5 years</td>
<td>0.82</td>
<td>??</td>
<td>361</td>
<td>$92,900</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td></td>
<td>(Probably better)</td>
<td>??</td>
<td>??</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CXR ⁷</td>
<td>55-74</td>
<td>Yearly x 4</td>
<td>0.94 (0.81-1.10)</td>
<td>1.6%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Low-dose CT ⁸</td>
<td>55-74</td>
<td>Yearly x 3</td>
<td>0.80 (0.73-0.93)</td>
<td>1.7%</td>
<td>320</td>
<td>$72,800* (vs. CXR)</td>
</tr>
</tbody>
</table>

5. Stout JNCI 2006; 98(11): 774-782
7. Oken MM JAMA 2011; 306(17): 1865-1873
Summary

- Evidence shows that the number needed to screen to save one life among high risk individuals is 320.

- This compares favorably with other currently accepted methods of cancer screening both from an efficacy and cost standpoint.

- Harms?
Outline

• Screening background
  – (Some simple obvious truths about screening)

• Do people benefit from screening?
• What are the harms (and are they outweighed by benefits)?
• Can it be done in a cost effective manner?
What are the harms?

Can the harms be expected to be low in a general population?
Can they be further minimized?
“False positives”

- “Positive” is any non calcified nodule > 4 mm
  - 36% screened with LDCT had a positive finding (96% are not cancer)
  - Most are managed by follow up CT
  - A single additional CT at 6 months
    - 0, 12, 24 months or...
    - 0, 6, 12, and 24 months
An editorial comment

- False positive implies a test that suggests a disease is present when it is not
- In the context of a LDCT, a 5 mm nodule is considered “positive”
- Is this really a false positive?
  - 30+ years of cross sectional imaging makes this at worst, a manageable and very familiar problem (Shouldn’t lead to invasive testing)
Other screening harms?

- Anxiety/QOL
- Invasive procedures
- Overdiagnosis/Overtreatment
- Additional testing and costs
Anxiety/QOL

Impact of Lung Cancer Screening Results on Participant Health-Related Quality of Life and State Anxiety in the National Lung Screening Trial

Ilana F. Gareen, PhD1,2; Fenghai Duan, PhD1,3; Erin M. Greco, MS1; Bradley S. Snyder, MS1; Phillip M. Boiselle, MD4,5; Elyse R. Park, PhD, MPH6,7,8; Dennis Fryback, PhD9; and Constantine Gatsonis, PhD1,3

CONCLUSIONS: In a large multicenter lung screening trial, participants receiving a false-positive or SIF screen result experienced no significant difference in HRQoL or state anxiety at 1 or at 6 months after screening relative to those receiving a negative result.

KEYWORDS: quality of life, anxiety, lung cancer, screening, clinical trials.
Potential harms?

- Anxiety/QOL
- Invasive procedures
- Overdiagnosis/Overtreatment
- Additional testing and costs
### Complications after the Most Invasive Screening-Related Diagnostic Evaluation Procedure, According to Lung-Cancer Status.

#### Table 4. Complications after the Most Invasive Screening-Related Diagnostic Evaluation Procedure, According to Lung-Cancer Status.*

<table>
<thead>
<tr>
<th>Complication</th>
<th>Thoracotomy, Thoracoscopy, or Mediastinoscopy</th>
<th>Bronchoscopy</th>
<th>Needle Biopsy</th>
<th>No Invasive Procedure</th>
<th>Total number (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low-dose CT group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive screening results for which diagnostic information was complete</td>
<td>509 (100.0)</td>
<td>76 (100.0)</td>
<td>33 (100.0)</td>
<td>31 (100.0)</td>
<td>649 (100.0)</td>
</tr>
<tr>
<td>No complication</td>
<td>344 (67.6)</td>
<td>69 (90.8)</td>
<td>26 (78.8)</td>
<td>26 (83.9)</td>
<td><strong>465 (71.6)</strong></td>
</tr>
<tr>
<td>At least one complication</td>
<td>165 (32.4)</td>
<td>7 (9.2)</td>
<td>7 (21.2)</td>
<td>5 (16.1)</td>
<td><strong>184 (28.4)</strong></td>
</tr>
<tr>
<td>Most severe complication classified as major</td>
<td>71 (13.9)</td>
<td>2 (2.6)</td>
<td>0</td>
<td>2 (6.5)</td>
<td><strong>75 (11.6)</strong></td>
</tr>
<tr>
<td>Most severe complication classified as intermediate</td>
<td>81 (15.9)</td>
<td>5 (6.6)</td>
<td>7 (21.2)</td>
<td>2 (6.5)</td>
<td><strong>95 (14.6)</strong></td>
</tr>
<tr>
<td>Most severe complication classified as minor</td>
<td>13 (2.6)</td>
<td>0</td>
<td>0</td>
<td>1 (3.2)</td>
<td><strong>14 (2.2)</strong></td>
</tr>
<tr>
<td>Death within 60 days after most invasive diagnostic procedure†</td>
<td>5 (1.0)</td>
<td>4 (5.3)</td>
<td>1 (3.0)</td>
<td>0</td>
<td><strong>10 (1.5)</strong></td>
</tr>
<tr>
<td><strong>Radiography group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive screening results for which diagnostic information was complete</td>
<td>189 (100.0)</td>
<td>46 (100.0)</td>
<td>29 (100.0)</td>
<td>15 (100.0)</td>
<td>279 (100.0)</td>
</tr>
<tr>
<td>No complication</td>
<td>130 (68.8)</td>
<td>42 (91.3)</td>
<td>28 (96.6)</td>
<td>14 (93.3)</td>
<td>214 (76.7)</td>
</tr>
<tr>
<td>At least one complication</td>
<td>59 (31.2)</td>
<td>4 (8.7)</td>
<td>1 (3.4)</td>
<td>1 (6.7)</td>
<td>65 (23.3)</td>
</tr>
<tr>
<td>Most severe complication classified as major</td>
<td>22 (11.6)</td>
<td>1 (2.2)</td>
<td>0</td>
<td>1 (6.7)</td>
<td>24 (8.6)</td>
</tr>
<tr>
<td>Most severe complication classified as intermediate</td>
<td>32 (15.9)</td>
<td>2 (4.3)</td>
<td>1 (3.4)</td>
<td>0</td>
<td>35 (12.5)</td>
</tr>
<tr>
<td>Most severe complication classified as minor</td>
<td>5 (2.6)</td>
<td>1 (2.2)</td>
<td>0</td>
<td>0</td>
<td>6 (2.2)</td>
</tr>
<tr>
<td>Death within 60 days after most invasive diagnostic procedure†</td>
<td>4 (2.1)</td>
<td>5 (10.9)</td>
<td>1 (3.4)</td>
<td>1 (6.7)</td>
<td>11 (3.9)</td>
</tr>
</tbody>
</table>

---

### Complications after the Most Invasive Screening-Related Diagnostic Evaluation Procedure, According to Lung-Cancer Status.

#### Table 4. Complications after the Most Invasive Screening-Related Diagnostic Evaluation Procedure, According to Lung-Cancer Status.

<table>
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<th>Bronchoscopy</th>
<th>Needle Biopsy</th>
<th>No Invasive Procedure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low-dose CT group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitive screening results for which diagnostic information was complete</td>
<td>164 (100.0)</td>
<td>227 (100.0)</td>
<td>66 (100.0)</td>
<td>16,596 (100.0)</td>
<td>17,053 (100.0)</td>
</tr>
<tr>
<td>No complication</td>
<td>138 (84.1)</td>
<td>216 (95.2)</td>
<td>59 (89.4)</td>
<td>16,579 (99.9)</td>
<td>16,992 (99.6)</td>
</tr>
<tr>
<td>At least one complication</td>
<td>26 (15.9)</td>
<td>11 (4.8)</td>
<td>7 (10.6)</td>
<td>17 (0.1)</td>
<td>61 (0.4)</td>
</tr>
<tr>
<td>Most severe complication classified as major</td>
<td>9 (5.5)</td>
<td>2 (0.9)</td>
<td>0</td>
<td>1 (&lt;0.1)</td>
<td>12 (&lt;0.1)</td>
</tr>
<tr>
<td>Most severe complication classified as intermediate</td>
<td>13 (7.9)</td>
<td>9 (4.0)</td>
<td>6 (9.1)</td>
<td>16 (0.1)</td>
<td>44 (0.3)</td>
</tr>
<tr>
<td>Most severe complication classified as minor</td>
<td>4 (2.4)</td>
<td>0</td>
<td>1 (1.5)</td>
<td>0</td>
<td>5 (&lt;0.1)</td>
</tr>
<tr>
<td>Death within 60 days after most invasive diagnostic procedure†</td>
<td>2 (1.2)</td>
<td>4 (1.8)</td>
<td>0</td>
<td>5 (&lt;0.1)</td>
<td>11 (&lt;0.1)</td>
</tr>
<tr>
<td><strong>Diography group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitive screening results for which diagnostic information was complete</td>
<td>45 (100.0)</td>
<td>46 (100.0)</td>
<td>24 (100.0)</td>
<td>4,559 (100.0)</td>
<td>4,674 (100.0)</td>
</tr>
<tr>
<td>No complication</td>
<td>38 (84.4)</td>
<td>46 (100.0)</td>
<td>23 (95.8)</td>
<td>4,551 (99.8)</td>
<td>4,658 (99.7)</td>
</tr>
<tr>
<td>At least one complication</td>
<td>7 (15.6)</td>
<td>0</td>
<td>1 (4.2)</td>
<td>8 (0.2)</td>
<td>16 (0.3)</td>
</tr>
<tr>
<td>Most severe complication classified as major</td>
<td>1 (2.2)</td>
<td>0</td>
<td>0</td>
<td>3 (0.1)</td>
<td>4 (0.1)</td>
</tr>
<tr>
<td>Most severe complication classified as intermediate</td>
<td>6 (13.3)</td>
<td>0</td>
<td>1 (4.2)</td>
<td>2 (&lt;0.1)</td>
<td>9 (0.2)</td>
</tr>
<tr>
<td>Most severe complication classified as minor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3 (0.1)</td>
<td>3 (0.1)</td>
</tr>
<tr>
<td>Death within 60 days after most invasive diagnostic procedure†</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3 (0.1)</td>
<td>3 (0.1)</td>
</tr>
</tbody>
</table>
Invasive procedures

- 16 deaths within 3 months of screen
  - 6 did not have cancer
  - 0.06% of the false positive vs 11.2% of true positives CT screens were associated with a major complication

- Surgical Mortality (1%)
  - National average 3-5%
Potential harms?

- Anxiety/QOL
- Invasive procedures
- Overdiagnosis/Overtreatment
- Additional testing and costs
Overdiagnosis Bias

This is the harm that concerns me the most as it is the hard to quantify, but…

Survival is 33%

Survival is 0%

Potential harms?

- Overdiagnosis/Overtreatment
  - Studies estimate that this occurs in 9%-18.5% of screen detected lung cancers
  - Estimates of overdiagnosis are time dependent (Relative to competing mortality)
    - Also dependent on comorbidity
Potential harms?

• Anxiety/QOL
• Invasive procedures
• Overdiagnosis/Overtreatment
• Additional testing and costs
Outline

• Screening background
  – (Some simple obvious truths about screening)

• Do people benefit from screening?

• What are the harms (and are they outweighed by benefits)?

• Can it be done in a cost effective manner?
15-year costs of QALY saved by lung cancer screening.

<table>
<thead>
<tr>
<th>Screening Method</th>
<th>NY-ELCAP Stage Shift</th>
<th>NLST Stage Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung cancer screening and treatment costs</td>
<td>$277,324,128,342</td>
<td>$34,054,299,361</td>
</tr>
<tr>
<td>QALYs saved by screening and treatment</td>
<td>$855,854</td>
<td>722,795</td>
</tr>
<tr>
<td>Cost per QALY saved</td>
<td>$28,240</td>
<td>$47,115</td>
</tr>
<tr>
<td>Screening + light smoking cessation intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional costs for cessation</td>
<td>$1,361,556,665</td>
<td>$1,361,556,665</td>
</tr>
<tr>
<td>Additional QALYs saved by cessation</td>
<td>273,566</td>
<td>273,566</td>
</tr>
<tr>
<td>Cost per QALY saved</td>
<td>$23,198</td>
<td>$35,545</td>
</tr>
<tr>
<td>Screening + intensive smoking cessation intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. NRT generic plus behavioral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional costs for cessation</td>
<td>$3,212,191,737</td>
<td>$3,212,191,737</td>
</tr>
<tr>
<td>Additional QALYs saved by cessation</td>
<td>930,754</td>
<td>930,754</td>
</tr>
<tr>
<td>Cost per QALY saved</td>
<td>$16,198</td>
<td>$22,537</td>
</tr>
<tr>
<td>B. Bupropion generic plus behavioral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional costs for cessation</td>
<td>$4,088,822,965</td>
<td>$4,088,822,965</td>
</tr>
<tr>
<td>Additional QALYs saved by cessation</td>
<td>930,754</td>
<td>930,754</td>
</tr>
<tr>
<td>Cost per QALY saved</td>
<td>$23,067</td>
<td>$23,067</td>
</tr>
<tr>
<td>C. Chantix plus behavioral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional costs for cessation</td>
<td>$5,342,861,783</td>
<td>$5,342,861,783</td>
</tr>
<tr>
<td>Additional QALYs saved by cessation</td>
<td>930,754</td>
<td>930,754</td>
</tr>
<tr>
<td>Cost per QALY saved</td>
<td>$23,826</td>
<td>$23,826</td>
</tr>
</tbody>
</table>

*NLST estimate is $72k

Villanti AC, (2013) PLoS ONE 8(8). e71379
Factors affecting cost effectiveness of LDCT screening

**Increasing costs**
- Higher cost of LDCT
- Screening lower risk individuals (*Steep*)
- Increased frequency of follow up CTs

**Decreases Costs**
- Higher lung ca risk
- Tobacco cessation
- Further catch up cases in CXR arm
- Efficacy of CXR screening (none)
- Fewer follow up CTs
- Increasing rate of tobacco cessation
Lung Cancer Risk?

Kirk, Spock, McCoy, and Ensign Ricky are beaming down to the planet. Guess who’s not coming back.
http://www.brocku.ca/lung-cancer-risk-calculator

<table>
<thead>
<tr>
<th>Characteristics to be entered</th>
<th>Enter Values</th>
<th>Centered or referent</th>
<th>Coefficient</th>
<th>Contribution to estimate</th>
<th>ORs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>55</td>
<td>62</td>
<td>0.0778868</td>
<td>-0.5452076</td>
<td>1.08</td>
</tr>
<tr>
<td>Education (enter the highest level obtained)</td>
<td></td>
<td>4</td>
<td>4</td>
<td>-0.0812744</td>
<td>0</td>
</tr>
<tr>
<td>Body Mass Index (BMI, weight in kg/height in meters*2)</td>
<td>28</td>
<td>27</td>
<td>-0.0274194</td>
<td>-0.0274194</td>
<td>0.97</td>
</tr>
<tr>
<td>COPD, emphysema or chronic bronchitis (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>0.3553063</td>
<td>0</td>
<td>1.43</td>
</tr>
<tr>
<td>Personal history of cancer (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>0.4689971</td>
<td>0</td>
<td>1.68</td>
</tr>
<tr>
<td>Family history of lung cancer (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>0.587185</td>
<td>0</td>
<td>1.80</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (referent group) (0=No; 1=Yes)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Black (non-Hispanic) (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>0.3944778</td>
<td>0</td>
<td>1.48</td>
</tr>
<tr>
<td>Hispanic (0=No, 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>-0.7434744</td>
<td>0</td>
<td>0.48</td>
</tr>
<tr>
<td>Asian (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>-0.466585</td>
<td>0</td>
<td>0.63</td>
</tr>
<tr>
<td>American Indian/Alaskan Native (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander (0=No; 1=Yes)</td>
<td>0</td>
<td>0</td>
<td>1.027152</td>
<td>0</td>
<td>2.79</td>
</tr>
<tr>
<td>Smoking status.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = Former smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Current-smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of cigarettes smoked per day**</td>
<td>50</td>
<td>-0.202154161</td>
<td>-1.822606</td>
<td>0.368447387 nonlinear</td>
<td></td>
</tr>
<tr>
<td>Duration smoked (years)</td>
<td>30</td>
<td>27</td>
<td>0.0317321</td>
<td>0.0951963</td>
<td>1.03</td>
</tr>
<tr>
<td>Years ago quit smoking. Enter zero for current smokers</td>
<td>2</td>
<td>10</td>
<td>-0.0308572</td>
<td>0.2468576</td>
<td>0.97</td>
</tr>
<tr>
<td>Model constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \text{Probability of lung cancer} = 0.012 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

LUNG CANCER CT SCREENING

Should I get screened?

LEARN MORE
Summary

- Evidence shows that properly screening high risk people saves lives
- Minimizing harms...
  - Follow published guidelines on management of nodules
  - Most nodules **DO NOT** require biopsy
  - Screen healthy, high risk people
- Maximizing benefits
  - Validate risk models
  - Develop biomarkers