LUNG CANCER SCREENING AND SMOKING CESSATION

National Cancer Policy Forum Workshop on Reducing Tobacco-Related Cancer Incidence and Mortality

June 11, 2012
Background

- Low dose helical computed (CT) detects many lung tumors at early stage (ELCAP, 2001)
- NLST observed 20% decrease in lung cancer specific mortality in the low dose CT group as compared to the chest x-ray group (NLST, 2011)
  - Age 55+
  - Current smokers
  - Former smokers who quit within the past 15 years
  - At least 30 pack-year history
- Clinical guidelines are currently being reviewed and approved by professional societies (e.g., NCCN, ACS, USPTF, Chest)
Potential benefits and harms of CT screening for lung cancer

- Opportunity for delivery of quitting advice and tobacco cessation treatment?
- Justification of continued smoking?
Why Does Lung Cancer Screening Provide an Invaluable Opportunity to Promote Smoking Cessation?

- Access to smokers with longstanding history of heavy tobacco use
- Personalize tobacco-related risks of persistent tobacco use
- Multiple potential encounters with health care providers
What Are the Challenges in Promoting Smoking Cessation in Lung Cancer Screening Settings?

- Variable quitting motivation of screening enrollees
- Variable readiness, resources and capacity of lung cancer screening sites/staff
- Inconsistent delivery of smoking cessation treatment in lung screening clinical programs
- Most smokers will get “good news”. Will normal results reduce quitting motivation and provide “license to smoke”? 
Key Questions

- How motivated to quit are screening participants?
- What is the impact of undergoing screening on smoking cessation?
  - Do screening results influence post-screening cessation?
- What are some clinical models for promoting smoking cessation in lung cancer screening protocols?
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Smokers’ Interest in Being Screened for Lung Cancer, By Motivation to Quit (n=585)

Source: Hahn et al. 2006
Motivation to Quit Smoking: NLST/ACRIN Trial

- Current smokers (n=312):
  - 70% Considering quitting
  - 17% Preparing to quit
  - 13% No quitting intentions

- Former smokers (n=260):
  - 23% Concerned about smoking relapse

Source: Park et al, 2009
Readiness to Quit Smoking (NY-ELCAP) n=2079

- **Stages of readiness**
  - Seriously thinking of quitting within the next 30 days - *Preparation* (31.6%)
  - Seriously thinking of quitting within the next 6 months - *Contemplation* (46.7%)
  - Not seriously thinking of quitting – *Pre-contemplation* (21.7%)

- **Effort to quit since CT appointment was made** (37.4%)

- **Belief that quitting reduces lung cancer risk**
  - Not at all (6%)
  - Somewhat (18%)
  - Moderately (25%)
  - Very much (51%)

Ostroff et al, 2011 SBM
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Validity of Self-Reported Smoking Abstinence

- Compared self-reported smoking status vs urinary cotinine levels
- Smokers (n=55) enrolled in lung ca screening RCT
  - 59 years old, 96% Caucasian, 55% male
  - Self-reported smoking status and urinary cotinine levels were highly consistent
    - 7% misclassification rate
    - 100% sensitivity (excluding NRT users)
    - 95% specificity (excluding NRT users)

Source: Studts et al, 2006
<table>
<thead>
<tr>
<th>Paper</th>
<th>Site</th>
<th>Design</th>
<th>Sample</th>
<th>Quit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ostroff, 2001</td>
<td>Cornell-ELCAP</td>
<td>Cross-sectional</td>
<td>134 baseline current smokers (CS)</td>
<td>23%</td>
</tr>
<tr>
<td>Cox 2003</td>
<td>Mayo</td>
<td>Longitudinal</td>
<td>901 CS</td>
<td>14%</td>
</tr>
<tr>
<td>Clark, 2004</td>
<td>Mayo</td>
<td>Cessation RCT</td>
<td>171 CS</td>
<td>5-10%</td>
</tr>
<tr>
<td>Townsend, 2005</td>
<td>Mayo</td>
<td>Longitudinal 3 yr</td>
<td>926 CS</td>
<td>20-40%</td>
</tr>
<tr>
<td>MacRedmond, 2006</td>
<td>Dublin</td>
<td>Longitudinal 2 yr</td>
<td>307 CS</td>
<td>19%</td>
</tr>
<tr>
<td>Taylor et al, 2007</td>
<td>Georgetown LSS</td>
<td>Longitudinal</td>
<td>162 CS</td>
<td>7%</td>
</tr>
<tr>
<td>Ashraf et al 2009</td>
<td>DLCST</td>
<td>Screening RCT</td>
<td>1545 CS in CT arm</td>
<td>12%</td>
</tr>
<tr>
<td>Anderson et al 2009</td>
<td>ELCAP</td>
<td>Longitudinal 6 yr</td>
<td>730 baseline smokers 1227 former smokers</td>
<td>29% 4%</td>
</tr>
<tr>
<td>Aalst et al, 2010</td>
<td>NELSON</td>
<td>Longitudinal 2 yr</td>
<td>1084 male CS</td>
<td>17%</td>
</tr>
<tr>
<td>Ostroff et al, 2011</td>
<td>NY-ELCAP</td>
<td>Longitudinal 1 yr</td>
<td>1580 CS</td>
<td>16%</td>
</tr>
</tbody>
</table>
The Effect of “Hypothetical” Scan Result on Quitting Intentions

Source: Schnoll et al. 2003
Change in Readiness to Quit from Baseline to Follow-up, Stratified By Screening Result, Age <64 years old

Source: Taylor et al 2007
Effect of CT Scan Results on 3 year Smoking Abstinence Rates (n=926 smokers)

Source: Townsend et al, 2005
<table>
<thead>
<tr>
<th>Citation</th>
<th>Abstinence Rates by CT Screening Results</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Ostroff et al, 2001</td>
<td>62%</td>
</tr>
<tr>
<td>Aalst et al 2009</td>
<td>15%</td>
</tr>
<tr>
<td>Townsend et al, 2005</td>
<td>42%</td>
</tr>
<tr>
<td>Ashraf et al 2009</td>
<td>18%</td>
</tr>
<tr>
<td>Styn et al 2008</td>
<td>18%</td>
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Key Questions

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Cessation Treatment Model

CT Screening Visit

MD Advice (Radiologist)

Brief Cessation Counseling (RN/Health Educator)

Notification of CT Scan Results

- Booster counseling to smoker
- Booster prompt to referring MD
Effectiveness of Self Help Materials in a Lung Cancer Screening Population

171 current smokers seeking lung CT scan

**Standard Print**
- One Year F/U
  - 48% quit attempt
  - 10% 7 day abstinence

**Internet Referral & Resources**
- One Year F/U
  - 68% quit attempt (p=.01)
  - 5% 7 day abstinence (ns)

Source: Clark et al, 2004
Pilot study of Nurse-Delivered Smoking Cessation Intervention

18 current smokers seeking lung CT scan

Before CT
12 counseling sessions
NRT or varenicline

6 mos F/U
22% 7 day abstinence

After CT
12 counseling sessions
NRT or varenicline

6 mos F/U
11% 7 day abstinence (ns)

Source: Ferketich et al, 2011
## Legacy Project
### Brief Cessation Intervention Conditions

<table>
<thead>
<tr>
<th>Self Help Only (Group A) n=323</th>
<th>Enhanced Self-Help (Group B) n=312</th>
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<tbody>
<tr>
<td><em>Become an Ex</em>, American Legacy Foundation</td>
<td><em>Become an Ex</em>, American Legacy Foundation</td>
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<tr>
<td>Referral to National Quitline (1-800-QUIT-NOW)</td>
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</tr>
<tr>
<td>15 min motivational counseling provided at enrollment by trained study site coordinators</td>
<td>Personalized risk communication and decision tool – Patient</td>
</tr>
<tr>
<td></td>
<td>Personalized risk communication and decision tool – Referring MD</td>
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<td></td>
<td>Offered Tobacco Cessation Toolkit to Referring MD</td>
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</tbody>
</table>

Ostroff et al, 2012 SRNT
Comparison of two minimal contact cessation interventions: 12 month follow-up results

Ostroff et al, 2012 SRNT

- Quit Rate
  - Enhanced: 20%
  - Self-Help: 19%

- Reduction in cigarettes per day from baseline
  - Enhanced: 33%
  - Self-Help: 33%

- Tried to quit since enrollment
  - Enhanced: 66%
  - Self-Help: 67%
Self-reported Use of Smoking Cessation Strategies

Ostroff et al, 2012 SRNT
Summary

- Most smokers enrolling in CT lung screening programs are motivated to quit
- Higher quit rates than generally observed in naturalistic studies
- Inconclusive results on the impact of screening results on cessation outcomes
- Low utilization of evidence-based cessation approaches
Future Goals

- To integrate brief, evidence-based smoking cessation interventions in the context of lung cancer screening
  - Dose intensity (minimal, intensive)
  - Clinical milieu (onsite, link to quitlines, etc)
  - Optimal timing
  - Personalized risk communication
- To identify modifiable barriers and facilitators (e.g., perceived risk, cancer worry, perceived benefits of quitting) so as to guide the development and evaluation of effective cessation interventions for high risk smokers.
Tobacco Cessation and Screening

Relevant Questions

- Should delivery of smoking cessation treatment be included (mandated for coverage) in emerging clinical protocols?
- What is an appropriate approach for counseling patient with a negative screen?
- What tobacco-related data should be collected by lung cancer screening programs?