Effects of a lung cancer screening decision aid on overdiagnosis knowledge and screening intent in primary care patients

Preventing Overdiagnosis 2016

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Background - Benefit from screening in NLST

- National Lung Screening Trial (NLST) found annual low dose CT scanning reduced lung cancer mortality compared with chest radiography by ~0.3% (absolute)

Harms: False positives in NLST

• About 365 per 1000 screened individuals had at least one false positive screen
• Most of these were resolved with further imaging, but 7-8% led to an invasive procedure
Overdiagnosis in NLST

• Analysis of excess cancers detected in NLST
• 18.5% (95% CI 5.4%, 30.6%) chance that a given screen-detected lung cancer was a case of overdiagnosis
• \( \text{#Overdiagnosed/Lung cancer death averted} = 1.38 \)

USPSTF now recommends

• annual CT screening for NLST-eligible individuals
  • 55-80 yrs; ≥30 pack years; smoke currently or quit within 15 years
• shared decision making including “thorough discussion” of benefits, limitations, and “known and uncertain harms”
Supporting appropriate implementation of lung cancer screening – 3 projects

1. Deliberative democracy (community jury) methods to guide decisions about screening “intensity”
2. Decision aid development and testing
3. Implementation pilot
Policy help from CMS

- Centers for Medicare & Medicaid Services (CMS)
  - Largest single public healthcare insurer in the US
  - Mainly covers persons age 65 and older
  - Requires a “shared decision making visit” for lung cancer screening

“...including 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.”
Many implementation problems

• To name one (relevant to POD)
  • Communicating about harms is difficult, especially overdiagnosis
Purpose of decision aid pilot study

1. Develop and test a CMS-compliant lung cancer screening decision aid video
2. Estimate effects of the decision aid on
   - Overdiagnosis knowledge
   - General screening attitudes (enthusiasm)
   - Screening intent
Methods

• **Design:** single group (pre-post) pilot study (n=50)

• **Participants:** USPSTF guideline-eligible
  • 55-80 years, 30+ pack years, current smoker or former smoker who has quit within 15 years
  • Active patients in one US academic primary care practice

• **Study flow:**
  • Pre-decision aid survey
  • 6-minute video decision aid on lung cancer screening
  • Post-decision aid survey
  • 3 month chart review for screening behavior (in progress)
## Outcomes

<table>
<thead>
<tr>
<th>Outcome (pre-post)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability</td>
<td>Perceived usefulness, balance etc.</td>
</tr>
<tr>
<td>Overdiagnosis knowledge</td>
<td>7-item scale of conceptual knowledge, adapted from Hersch, et al., 2015*</td>
</tr>
<tr>
<td>Cancer screening enthusiasm</td>
<td>30 point scale adapted from DeFrank, et al., 2015</td>
</tr>
<tr>
<td>Intent to initiate screening</td>
<td>Single 5-point Likert item, dichotomized for analysis</td>
</tr>
</tbody>
</table>

Example overdiagnosis knowledge items

• ALL lung cancers will eventually cause illness and death if they are not found and treated. (False)

• Screening tests lead some people to get cancer treatments that they do not need. (True)
Example screening attitudes items

• Getting screened is the right thing to do.
• I would feel like I'd done something wrong if I skipped a regular screening.

Response options: 5 point Likert
(Strongly agree <-> Strongly disagree)
Decision Aid

How important are these benefits and harms to you?

Pictogram adapted from US Veterans Health Administration, National Center for Health Promotion and Disease Prevention
# Results – Participant Characteristics (n=50)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Average or %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>63</td>
</tr>
<tr>
<td>Sex (% Female)</td>
<td>48%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>58%</td>
</tr>
<tr>
<td>Black</td>
<td>30%</td>
</tr>
<tr>
<td>Other</td>
<td>12%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>≤ 12 years</td>
<td>50%</td>
</tr>
<tr>
<td>Smoking status (% current) smoker</td>
<td>46%</td>
</tr>
<tr>
<td>Pack years smoked</td>
<td>52</td>
</tr>
</tbody>
</table>
Conceptual knowledge of overdiagnosis

Adapted from Hersch, et al., 2015

<table>
<thead>
<tr>
<th>n=50</th>
<th>Pre</th>
<th>Post</th>
<th>Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overdiagnosis knowledge* (on 7 point scale)</td>
<td>1.8</td>
<td>4.1</td>
<td>2.32 (1.47, 2.17)</td>
</tr>
</tbody>
</table>
## Decision Aid Acceptability

<table>
<thead>
<tr>
<th>Acceptability Item (n=50)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I found the decision aid:</td>
<td></td>
</tr>
<tr>
<td>Slanted toward getting screened for lung cancer</td>
<td>16 (32%)</td>
</tr>
<tr>
<td>Balanced</td>
<td>29 (58%)</td>
</tr>
<tr>
<td>Slanted toward NOT getting screened for lung cancer</td>
<td>5 (10%)</td>
</tr>
<tr>
<td>Would you have found this decision aid useful in making a decision about getting screened for lung cancer?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48 (96%)</td>
</tr>
<tr>
<td>No</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>Do you think we included enough information to help someone decide whether to be screened?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44 (88%)</td>
</tr>
<tr>
<td>No</td>
<td>6 (12%)</td>
</tr>
</tbody>
</table>

O'Connor & Cranney, 2002
# Cancer Screening Enthusiasm

<table>
<thead>
<tr>
<th>n=50</th>
<th>Pre</th>
<th>Post</th>
<th>Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer Screening Enthusiasm—30 point scale</td>
<td>19.5</td>
<td>17.6</td>
<td>1.9 (.81, 2.9)</td>
</tr>
</tbody>
</table>

DrFrank, et al., 2015
Results – Screening Intent

• Proportion with intent to start annual screening did not change
  (pre-video: 54%, post-video: 50%)
Limitations

• One-group (pre-post) study, no control
• Small, single site study
Conclusions

- A video decision aid for lung cancer screening
  - Improved knowledge of overdiagnosis from screening
  - Modestly reduced enthusiasm about cancer screening
  - Did not substantially change intent to begin screening
Lessons and observations

• Decision aids can increase knowledge of overdiagnosis and modestly affect attitudes
• However, patient decision aids alone are unlikely to have a large impact on screening behavior
• Other interventions that affect screening intensity including policy, system, and provider-directed interventions are needed
  • CMS guidelines are an example
• A narrow population of patients appears to derive net benefit from screening; systematically identifying them in practice is difficult
• Appropriate implementation of lung cancer screening across the continuum of care is resource intensive
Acknowledgements

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