



**Steven B. Zeliadt, PhD**

# Implementing Smoking Cessation into Delivery of Lung Cancer Screening

# Outline for Today

- Motivation for the qualitative study of smokers being offered lung cancer screening
  - My background in population outcomes of cancer screening
  - Lung cancer screening with low dose CT
- Qualitative study description & findings
- Pilot study of telephone intervention based on the qualitative study findings
- Launch of a multisite pragmatic trial utilizing VA Quitline

# Population Outcomes

- 1<sup>st</sup> job – Fred Hutchinson Cancer Research Center (Nicole Urban, ScD)
  - Linking mammography data to SEER cancer registry
  - Performance of screening - false negatives/sensitivity
- Questions about ensuring cancer screening contributes to population health
  - David Eddy, MD PhD – mathematical modeling of disease
  - Decision models – concepts of balancing benefits/harms/costs
  - Applied to cancer screening with chest x-ray, 7 studies 60s-80s



# Lung Cancer Screening

- 1970s & 80s – Screening with Chest X-ray

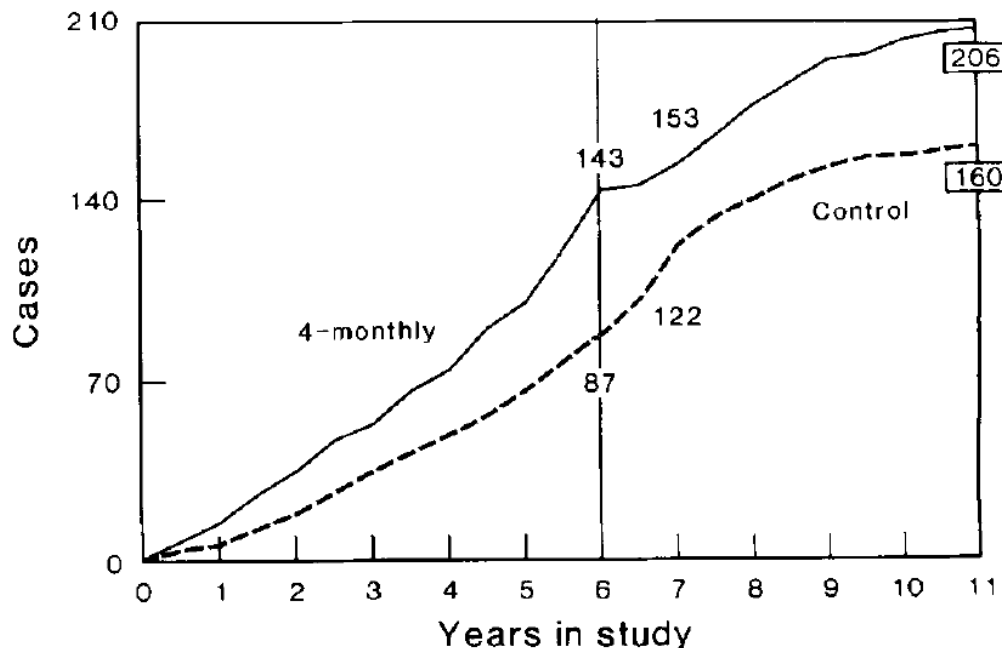


FIG. 1. Cumulative number of cases of lung cancer, Mayo Lung Project, by year in study; 4-monthly refers to group screened every 4 months (solid line), and control refers to control group (dashed line).

# No Difference in Deaths

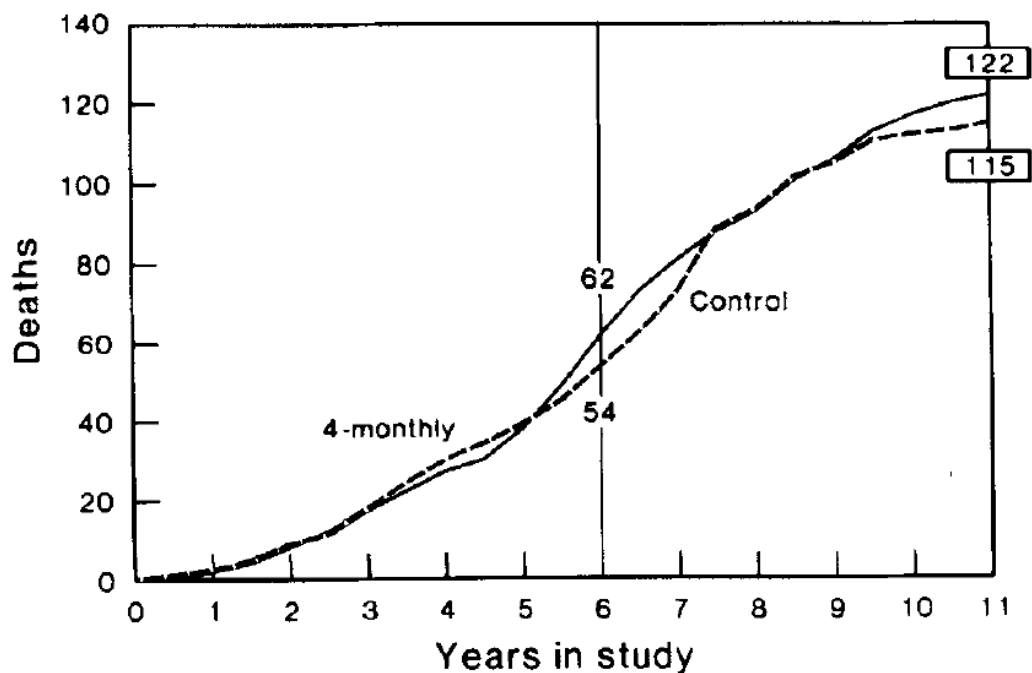


FIG. 8. Cumulative number of lung cancer deaths (includes postoperative deaths), Mayo Lung Project, by year in study; 4-monthly refers to group screened every 4 months (solid line), and control refers to control group (dashed line).



# 1989 Commentary

## DIAGNOSIS AND TREATMENT

### Screening for Lung Cancer

David M. Eddy, MD, PhD

Lung cancer is the commonest cause of death from cancer both men and women, with approximately 152 000 new cases and 139 000 deaths in 1988. The incidence and mortality rates are increasing rapidly in women. Two main tests

The main harms are the possibility of a false-positive result and consequent work-up (in the range of 0% to 10% per examination for the chest roentgenogram and 0% to 1% for the sputum cytology examination), the small possibility of an incorrect diagnosis of lung cancer, a false sense of security, and a decreased motivation to stop smoking. The main costs are those of the examinations and the work-ups for false-positive test results. The main benefit is whatever psychological comfort the patient and physician derive from doing the examinations; there is no evidence the patient's chance of dying from lung cancer will be decreased by early detection.

# National Lung Screening Trial

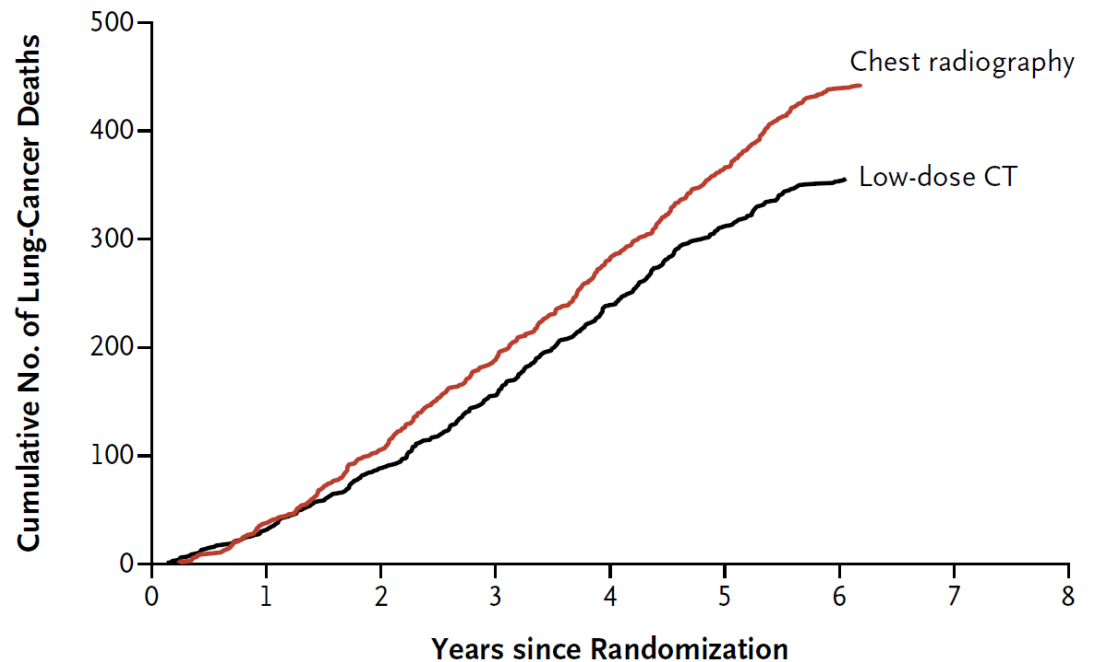
## X-Ray -> Computed Tomography



# NLST Results (August 2011)

- 53,500 individuals randomized (30+ pack year, ages 55-74)
- Launched in 2002, recruitment goal 2004, stopped early 2011
- 33 radiology clinics
- \$250 million

**B** Death from Lung Cancer





# Motivation for Integrating Smoking Cessation

- National Lung Screening Trial
  - 1000 screenees → 3 lung cancer deaths avoided
  - Individual gain overall = 0.3 years of life (varies by cancer risk)
  - Cost-effectiveness estimates uncertain  
(~ \$52,000 to \$186,000 per QALY)
- Smoking cessation (Decades of experience)
  - 1000 quitters (age 55-64) → 56 deaths avoided
  - Individual gain of cessation (55-64) = 4+ years of life
  - No harms; Highly cost-effective, often cost-saving

*Aberle NEJM 2010, Black NEJM 2014, Raymakers AHE 2016, Woloshin JNCI 2008, Fucito Cancer 2016, Jha NEJM 2013, Stapleton & West NTR 2012, Rigotti AJPM 2011*

# Audience Participation - 1

- For people over age 55 who are current smokers, which is more likely to prevent the most deaths?
  - Lung cancer screening will prevent more deaths
  - Quitting smoking will prevent more deaths
  - They are equally effective
  - Not sure

## Audience Participation - 2

- Who is listening to the presentation today? (Check all that apply)
  - Provider lung cancer screening/cessation focus
  - Provider no specialized focus on LCS or smoking cessation
  - Researcher lung cancer screening/cessation focus
  - Researcher no focus on LCS or smoking cessation
  - Other - just curious about the topic

# Moving from Trial to the Clinic

- Aug 2011 - National Lung Screening Trial results
- Mar 2013 - VA Demonstration Project 8 sites selected
- Dec 2013 - USPSTF “B” final recommendation
- Feb 2015 - CMS coverage with conditions decision
- Oct 2015 - VA Demonstration Project ends
- VA Implementation at discretion of local Medical Directors

*Kinsinger Ann Int Med 2014; Kinsinger JAMA Int Med 2017*

# Guidelines and Recommendations

- All recommendations highlight importance of cessation
- CMS requires decision-making support to include cessation counseling




# Challenges to Integration of Cessation


- Logistical challenges
- No care models - How to adapt existing approaches?
- National Lung Screening Trial
  - 10% providers offered appropriate treatment support (5As)
- Survey of 97 screening clinics
  - 57% routinely counsel; 37% recommend medications
- NCI recently funded 6 trials: Smoking Cessation and Lung Cancer Screening (SCALE) Collaboration & 2 additional externally funded trials including our pragmatic trial

# Demonstration Project – Smoking Cessation

- Provided guidance to sites that it was important
- Integrated VA Quitline information in patient materials

VA |  U.S. Department of Veterans Affairs  
Veterans Health Administration  
Patient Care Services  
Health Promotion and Disease Prevention

## Screening for Lung Cancer



**REMEMBER:** The best way to prevent lung cancer is to STOP SMOKING. If you are still smoking, talk with your VA health care team and call 1-855-QUITVET (1-855-784-8838). WE CAN HELP!

### Should I be screened for lung cancer?

You should consider being screened if you have all three of these risk factors:

- 55–79 years old **and**
- A current smoker or a former smoker who quit less than 15 years ago **and**
- You have a smoking history of at least 30 pack-years (this means 1 pack per day for 30 years or 2 packs a day for 15 years, etc.). The more you smoke and the longer you smoke, the higher your risk for lung cancer.

### What is screening?

- Screening is looking for a disease before a person has any symptoms. Screening helps find lung cancer in an early, more treatable stage.
- In a group of 1000 people screened once a year for 3 years, 3 fewer people in 1000 died of lung cancer after 6 years. This means, instead of 21 people in 1000 dying of lung cancer, 18 people in 1000 died of lung cancer.

### Why do we not screen everyone?

- There is no proof from research that it is best to screen everyone.
- Screening everyone can cause more harm than good. False alarms lead to more testing and risk of harm.

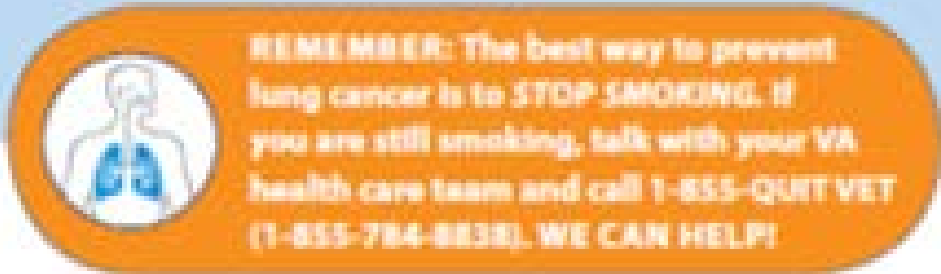
### Is there a cost for the screening?

If you are charged co-pays for your VA visits, you will be charged a \$50.00 co-pay for the day you have the CT scan visit.

### How is screening for lung cancer done?

- We screen for lung cancer using a low-dose chest Computerized Tomography scan (CT Scan). This CT scan gives a detailed picture of your lungs.
- You will go to the Radiology (x-ray) department for your CT scan. You will lie on a table and raise your arms above your head. Then the table will slide into the CT scanner. We will ask you to hold your breath for a few seconds during the scan.

VETERANS HEALTH ADMINISTRATION



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# Screening Delivery

No exclusions, patient is a current candidate for the lung cancer screening project.

[Link to patient brochure on lung cancer screening](#)

- Chest CT within the past 12 months outside of this VA.
- Patient agrees to lung cancer screening. Lung cancer screening information provided and low dose CT will be ordered.
- Refer patient to lung cancer screening coordinator for more information. Consult will be ordered.
- Patient is NOT interested in being screened for lung cancer at this time. Lung cancer screening information provided.

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Visit Info

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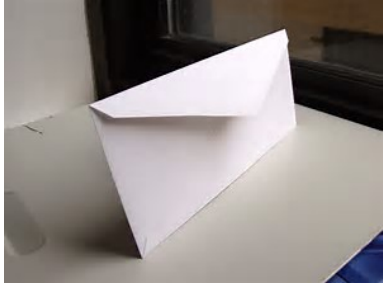
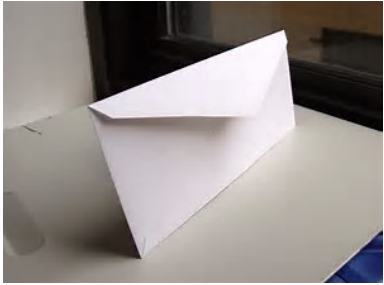
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Health Factors: **LCS NO EXCLUSIONS**

# General Pathways – Various Roles of Coordinators



# Many questions about smoking cessation

- How is smoking cessation being integrated?
- Is lung cancer screening (outside of trial setting) a teachable moment?
- How should providers talk to Veterans about smoking cessation?
- VA Demonstration Project coincided with CDC - Special Interest Project funding (13-068)



## Little data about effect of screening on cessation

	Screening	Control	
<b>NELSON trial</b>	14.5%	19.1%	p=0.05 (ITT=0.38)
<b>Danish trial</b>	11%	10%	p=0.47
<b>NLST</b>	23.8%	23.2%	p=0.38
<b>Mayo CXR</b>	14% (+1.9cigs)	14%	ns (<0.001)

*Slatore AnnATS 2014; Ashraf Thorax 2009; van der Aalst Thorax 2010; Tammemagi JNCI 2014; Shi Tob Induced Disease 2011*

Original Investigation

# Attitudes and Perceptions About Smoking Cessation in the Context of Lung Cancer Screening

Steven B. Zeliadt, PhD, MPH; Jaimee L. Heffner, PhD; George Sayre, PsyD; Deborah E. Klein, MD; Carol Simons, BA; Jennifer Williams, BA; Lynn F. Reinke, PhD, APRN; David H. Au, MD, MS

**IMPORTANCE** Broad adoption of lung cancer screening may inadvertently lead to negative population health outcomes if it is perceived as a substitute for smoking cessation.

**OBJECTIVE** To understand views on smoking cessation from current smokers in the context of being offered lung cancer screening as a routine service in primary care.

**DESIGN, SETTING, AND PARTICIPANTS** As an ancillary study to the launch of a lung cancer screening program at 7 sites in the Veterans Health Administration, 45 in-depth semi-structured qualitative interviews about health beliefs related to smoking and lung cancer screening were administered from May 29 to September 22, 2014, by telephone to 37 current smokers offered lung cancer screening by their primary care physician. Analysis was conducted from June 15, 2014, to March 29, 2015.

**MAIN OUTCOMES AND MEASURES** Attitudes and perceptions about the importance of smoking cessation in the context of lung cancer screening.

[← Invited Commentary](#)



Screening, and Enabling, Smokers NYT 9/8/2015

# Study Design

- Qualitative interviews
- Approached patients just after offered screening
- Identified via CDW
- Purposive sampling
  
- Interviews via telephone (nationally)
  - 2 interviews: before & after receiving their results

# Recruitment

- Approached 186 (20% participation rate)
- 45 interviews among 37 subjects – all current smokers
  - 8 before and after interviews
  - 23 interviewed after only
  - 6 interviewed before only
- 4 declined screening (11%)

# Interview guide

- Semi-structured interview guide
- Discussion goals focused on smoking cessation
- Veterans knew being offered screening because of smoking history
- Very willing to talk



# Participant Characteristics

**Table. Characteristics of Patients Who Participated in Study Interviews**

Characteristic	Value <sup>a</sup>
Age, mean (range), y	62 (55-72)
Sex	
Male	33 (89)
Female	4 (11)
Race	
White	23 (62)
Black or Pacific Islander	10 (27)
Missing/declined	4 (11)
Participants from a zip code area where $\geq 29.4\%$ of population has attained a bachelor's degree <sup>b</sup>	14 (38)
Pack-year history, mean (range), pack-years	49 (18-135)
Fagerström scores, mean (range) <sup>c</sup>	4.75 (0-10)
Nodule findings (<1 cm)	9 of 30 (30)
Nonpulmonary incidental findings noted	12 of 30 (40)

3 (8%) reported actively quitting

# Screening is Emotionally Stimulating

- Lung cancer screening is different than other cancer screening tests
  - Self-inflicted risks
  - Screening is measuring damage
  - Reflection about health

“What I liked best is that I figured I was going to know where I was standing with my...what damage I had done to my lungs”

“Given that I am a smoker the screening would be a benefit right now because at least I would know...where I am at right now in terms of if any signs of cancer are beginning to develop”

## Negative results = license to smoke

“Because it came back negative it is a positive part of your body that 45-50 years of this hasn’t contaminated it.

“People have been smoking for centuries and a lot of people over a hundred have been smoking for over 50 years and they haven’t had any problems... Maybe I am saying that for myself... Being able to go through this thing and finding out no huge abnormalities or problems going on with my x-ray [sic]. It’s a huge relief.”

## Focuses attention on lung cancer/distracts from other harms of smoking

- Patients with existing COPD, previous heart attacks, peripheral artery disease expressed how a negative test showed that their smoking hasn't harmed them

# Screening offers protection

- Finding nodules = saving lives
- Many smokers expected something to be found
- Detection of a small nodule, that can be followed and not treated, was often perceived very favorably



# Changes locus of control – External focus

- Everyone expressed that quitting (internal locus of control) is hard
- Screening was often contrasted to difficulty of quitting
- Finally able to do something
- Focus becomes repeat screening
  
- “No fuss, no muss”

“Two nodules on lungs and I am to go back to be checked again in 3 months... Thought a lot about it after the test. It [quitting] must be done – time to do it...

[Probed about next steps]: **I’m happy the nodules were small**, if they are large in 3 months, I will have to act.”

# Key Thoughts

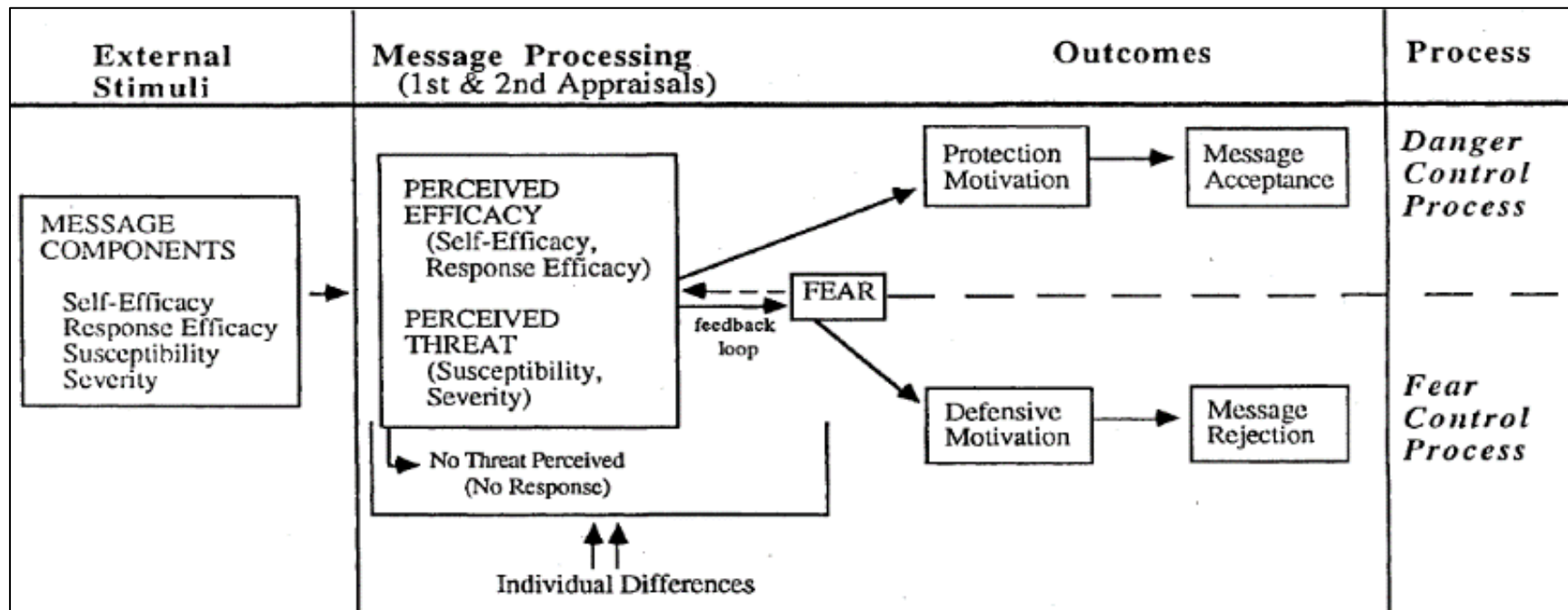
- Exaggerated beliefs about screening
- Clarifying risks is challenging
- Emotional reflection induced by screening is opportunity
  - Nuances to “teachable moment”
- Patients will interpret findings through lens of cognitive dissonance
  - Focus on emotional over technical (e.g. nodule size 6mm)
- Connect “external” agent to NRT and other tools
  - Long-term smoking history/heavy addiction

# Qualitative Findings -> Pilot Intervention

- HSR&D Pilot study: PPO-14-130-2
- Realistic clinical environment/resources
  - Limited clinical time (PCPs/Coordinators)
  - Patients more interested in screening than smoking cessation
    - Notifying patients rapidly is VA priority
  - Telephone - VA Quitline 1-855-QUIT-VET
    - Trained in motivational interviewing/smoking cessation

# Conceptual Model

- Extended Parallel Processing Model (EPPM)
  - Perceived threat + self-efficacy



# Study Activities

- Identified smokers when CT was ordered using CDW
  - 4 Sites: NY Harbor, Portland, Charleston, Durham
- Proactive outreach (using research approach procedures)
- Goal was 2 calls: before screening & after notified of results
- Intervention delivered by a clinical psychologist fellow
- Connect to VA cessation resources/warm hand-off VA Quitline
  
- Telephone survey 2-4 weeks later to assess outcomes
- Convenient control sample (2:1)



Characteristics	Intervention (N=27)	Control (N=56)	p-value
Mean age, years	64.2	64.4	0.86
<b>Sex</b>			
Female	7%	7%	0.99
<b>Race</b>			
White	74%	66%	0.82
Non-White	15%	18%	
Missing	11%	16%	
<b>Excellent or very good health</b>	31%	24%	0.59
<b>Has difficulty with medical literacy (4-item assessment)</b>	63%	54%	0.48
<b>Where receive majority of care</b>			
All/Mostly VA	85%	75%	0.60
Some VA and some non-VA	11%	20%	
Mostly non-VA	4%	5%	
<b>Result of screening test</b>			
Normal/no follow-up between annual screening is needed	63%	57%	0.64
Small nodule or incidental non- pulmonary finding was found needing additional follow up	37%	43%	

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	Intervention (N=27)	Control (N=56)	Relative Risk (95% Confidence Interval)
<b>7-day abstinence cigarettes</b>	12 (44%)	6 (11%)	4.1 (1.7 – 9.9)
<b>Tried to reduce how much you smoke since offered screening</b>	5 (19%)	4 (7%)	2.6 (0.8 – 8.9)
<b>Used VA Quitline</b>	4 (15%)	3 (5%)	2.8 (0.7 – 11.5)
<b>Confident you can quit smoking</b>	24 (89%)	36 (64%)	1.4 (1.1 – 1.8)
<b>Contemplation Ladder</b>			
<b>8-10 (High motivation)</b>	16 (59%)	19 (34%)	1.7 (1.1 – 2.8)
<b>0-7 (Low motivation)</b>	11 (41%)	37 (66%)	

<b>Patient Acceptability</b>	<b>Intervention (N=27)</b>
<b>Satisfied with telephone counseling</b>	
<b>Completely satisfied</b>	70%
<b>Somewhat satisfied</b>	19%
<b>Neither satisfied or dissatisfied</b>	4%
<b>Missing</b>	7%
<b>Discussion of smoking with counselor</b>	
<b>Extremely helpful</b>	48%
<b>Somewhat helpful</b>	33%
<b>A little or not at all helpful</b>	15%
<b>Missing</b>	4%
<b>Recommend to others?</b>	
<b>Definitely would</b>	59%
<b>Probably would</b>	22%
<b>Unsure</b>	4%
<b>Probably or definitely would not</b>	11%
<b>Missing</b>	4%

## Knowledge (% Correct)

	Intervention (N=27)	Control (N=56)	P-value
Does having a lung cancer screening test decrease your chances of getting lung cancer?	76%	70%	0.77
Which disease is the leading cause of death in Americans who smoke cigarettes?	30%	36%	0.80
True or False: If nothing abnormal or suspicious is found on your lung cancer screening test, it means you are safe from lung cancer for at least 12 months.	74%	55%	0.09
True or False: All nodules or spots found in the lungs eventually grow over time to be life threatening.	52%	48%	0.99
For people over age 55 who are current smokers, which is more likely to prevent the <u>most</u> premature deaths – lung cancer screening or quitting smoking.	63%	48%	0.16

# Reflections

- Period “offered thru receipt of results” is intervention opportunity
- Many misperceptions (~50% indicated safe from cancer for year)
- Veterans receptive to telephone counseling by someone other than a member of their care team
- Telephone outreach is promising approach to integrating cessation (*Taylor Lung Cancer 2017: 17% vs 4% quit rates*)



# Next Steps

- **Pragmatic trial:** Promoting smoking cessation in lung cancer screening through proactive therapy (PROACT) – Funded by VA HSR&D IIR
- Patients randomized to “structured” vs “unstructured” care when results letters are generated (n=500)
- Structured care includes:
  - Tailored results letter highlighting continued risk/need to quit
  - Mailed starter pack of NRT (no intent precondition)
  - 2 proactive calls by VA Quitline
- Outcomes include cessation & resource utilization

# Collaborators and Acknowledgements

- Veteran study participants & Patient Advisory Group
- VA Lung Cancer Screening Demonstration Project
- VA National Center for Health Promotion & Disease Prevention
- VA Tobacco Office
- Funding
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  - VA HSR&D/Office of Research – PPO-14-130-2
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  - Brian Ko
  - Larry Swanson
  - Carol Simons
  - Jennifer Williams
  - Kathryn Todd RN
  - Lynn Reinke APRN, PhD

# Thank You!

- Questions/Comments?
- Contact information  
    [steven.zeliadt@va.gov](mailto:steven.zeliadt@va.gov)