

VTAC
Vermont's Voluntary Action Against Cancer

Annual Meeting – Montpelier, VT - April 25, 2014

LUNG CANCER SCREENING: THE TIME HAS COME

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LUNG CANCER SCREENING: Why ... How ... Who ... Where ... When

- * Lung Cancer: The nation ... the state
- * Lung Cancer Screening: What is the evidence?
- * Lung Cancer Screening: Implementation
- * Lung Cancer Screening: The Vermont Population
- * Controversies
- * Challenges
- * Opportunities

LUNG CANCER: A NATIONAL EPIDEMIC

EPIDEMIC

LUNG CANCER

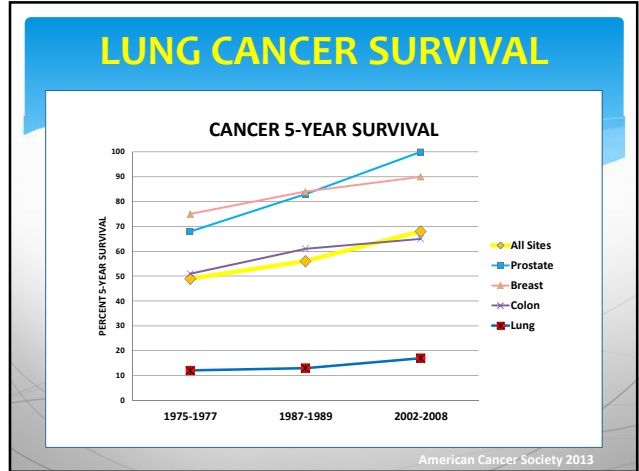
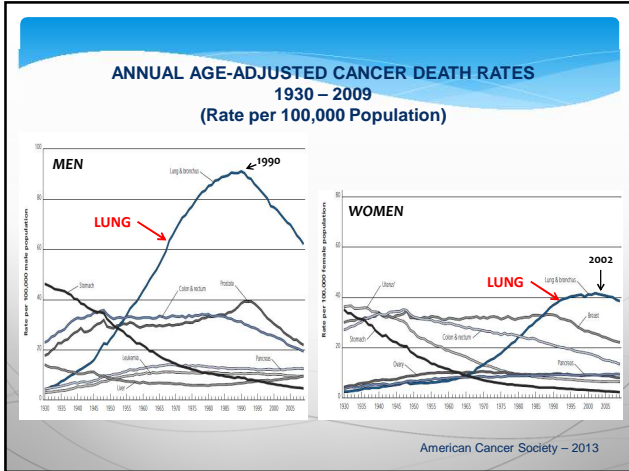
United States – 2013

(Estimates from the American Cancer Society)

GROUP	NEW CASES	DEATHS
BOTH MEN & WOMEN	228,190	159,480
MEN	118,080	87,260
WOMEN	110,110	72,220

Lung Cancer = 27% all cancer deaths

More people die of lung cancer than breast, prostate, and colon cancer combined



LUNG CANCER IN VERMONT

INCIDENCE = NEW CASES PER YEAR

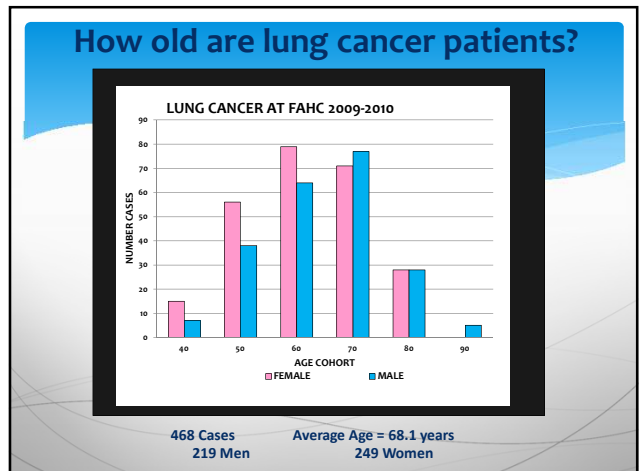
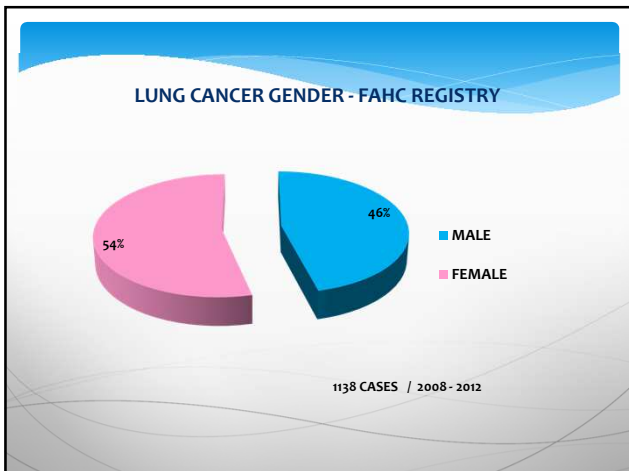
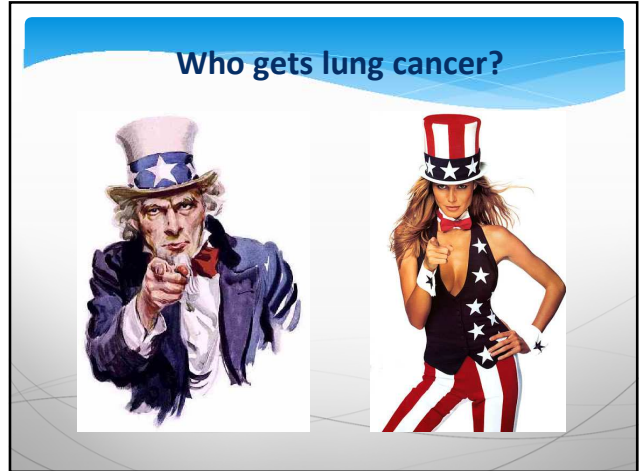
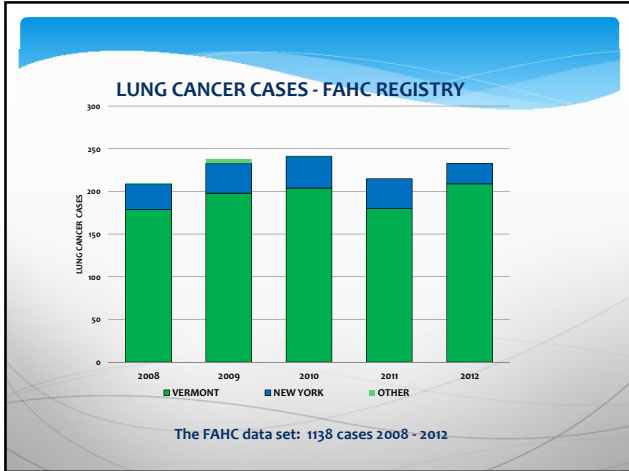
CANCER SITE	US Cases per 100,000	VT Cases per 100,000	VT CASES Per year
Lung	60.0	72.6 (+ 21%)	530
Prostate	159.9 (M)	141.9	506
Breast	127.6 (W)	131.5	514
Colon	44.3	41.9	306

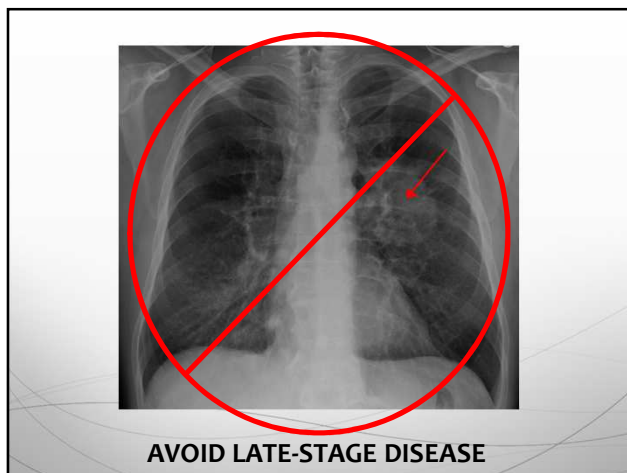
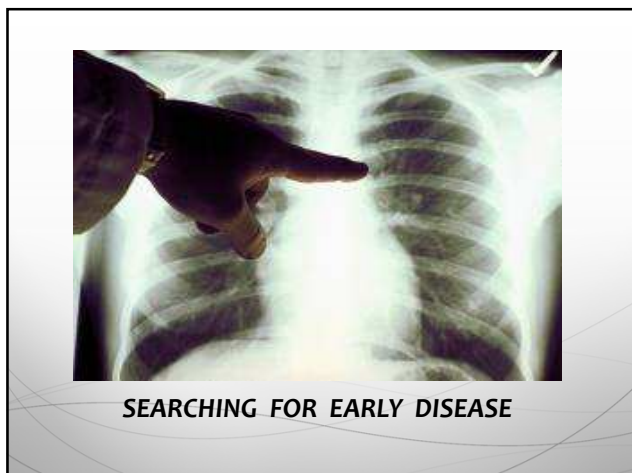
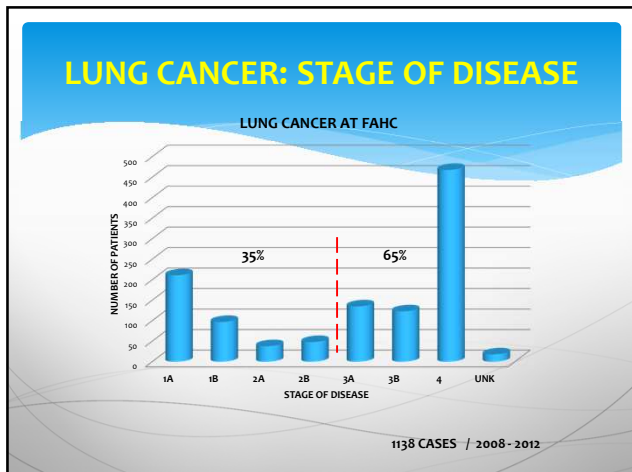
LUNG CANCER IN VERMONT

MORTALITY = DEATHS PER YEAR

CANCER SITE	US Deaths Per 100,000	VT Deaths Per 100,000	VT DEATHS Per year
Lung	49.5	52.5 (+ 6%)	382
Prostate	23.0 (M)	22.1	61
Breast	22.6 (W)	20.2	83
Colon	16.4	15.9	116

260





LUNG CANCER SCREENING Early Efforts Were Not Effective

- * Annual Chest X-ray
- * Sputum Cytology
- * Conventional Chest Computed Tomography Scan

- * Some increase in number of cancers found
- * No increase in survival
- * Flaws in study design
- * Small numbers of participants
- * Short observation period

EXTRA ... EXTRA ... READ ALL ABOUT IT !

The **NEW ENGLAND**
JOURNAL of **MEDICINE**

ESTABLISHED IN 1812 AUGUST 4, 2011 VOL. 365 NO. 5

Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

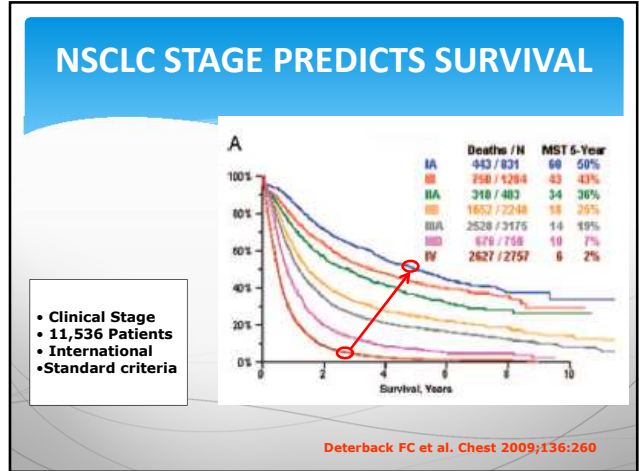
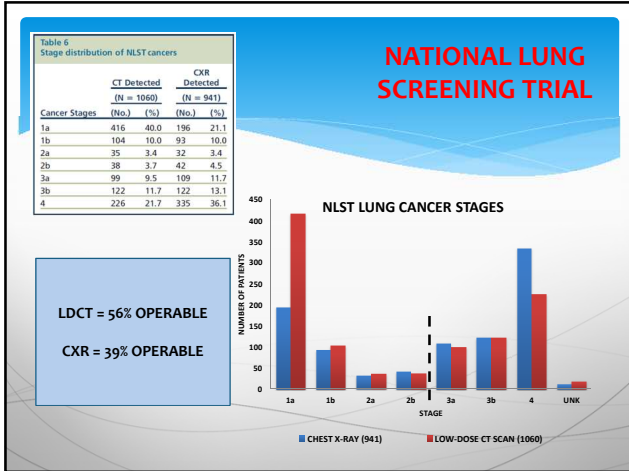
20% REDUCTION IN LUNG CANCER MORTALITY WITH LDCT SCREENING !

NLST KEY FINDINGS

CATEGORY	LDCT	CXR
Participants	26,722	26,732
Positive Results	18,146	5,043
Positive Percent	24.2%	6.9%
Positive Result =>1 over 3 years	39.1%	16.0%
False Positive Results (#)	17,497	4,764
False Positive Results (%)	96.4%	94.5%

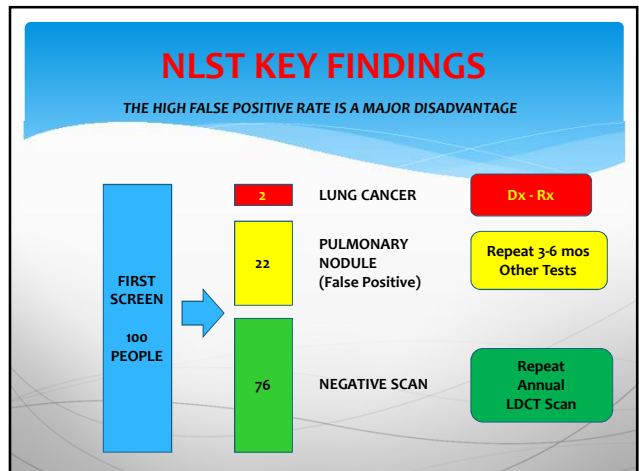
NLST KEY FINDINGS

CATEGORY	LDCT	CXR	
Lung Cancer Number	1,060	941	
Lung Cancer Rate / 10 ⁵ person-years	645	572	+13%
Lung Cancer Deaths	346	425	
Cancer Death Rate / 10 ⁵ person-years	247	309	P=0.004 -20.0%
All-Cause Deaths	1,877	2,000	P=0.02 -6.7%



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Annals of Internal Medicine | CLINICAL GUIDELINE

Screening for Lung Cancer: U.S. Preventive Services Task Force Recommendation Statement

Virginia A. Moye, MD, MPH, on behalf of the U.S. Preventive Services Task Force*

December 30, 2013 ... US Government Agency Recommends Low-Dose CT Scan Screening for Lung Cancer in High-Risk Subjects

- Recommendation Grade B
- Largely based on the National Lung Screening Trial
- Notes high false-positive rate & potential for harm
- Broadens eligibility slightly
- Mandates payment without deductible or copay from insurance
- Medicare has option to follow recommendation

LUNG CANCER SCREENING: HOW
LOW-DOSE CT SCAN (LDCT)

EXPOSURE	RADIATION DOSE
Natural Exposure	3 mSv / year
Transatlantic Flight	0.10 mSv
Chest X-ray	0.07 mSv
Low-Dose Chest CT	< 1.00 mSv
Chest CT + Contrast	5.00 mSv
Abdomen CT Scan	8.40 mSv



USPSTF ELIGIBILITY CRITERIA

- * AGE = 55 – 80 YEARS
- * SMOKING ≥ 30 pack-years
- * STATUS = Current Smoker or Quit ≤ 15 years

* LIKELY TO BENEFIT & SURVIVE



WHO IS AT HIGH RISK IN VERMONT?

- ☐ Vermont population = 626,630
- ☐ Vermont Adults = 502,557
- ☐ Vermont Adults / current smokers = 16%
- ☐ Vermont Adults / former smokers = 30% (?)
- ☐ Adults who meet USPSTF eligibility =
 - ☐ 12,000 – 25,000 → **16,000**
- ☐ Assume 45% participation → **7,200 Screen**

Vermont Department of Health - Center for Health Statistics. 2010 Adult Tobacco Survey. In: Health VDo, ed2011.

WHAT WOULD LUNG CANCER SCREENING ACHIEVE IN VERMONT?

- * **7,200 SUBJECTS SCREENED**
- * Observation for 5 years = 36,000 person years
- * Assume NLST results:
 - * No screening (CXR) = 309 deaths / 100,000 person years
 - * LDCT screening = 247 deaths / 100,000 person years
- * In the cohort who would have screening:
 - * No Screening = **111 lung cancer deaths**
 - * LDCT Screening = **89 lung cancer deaths**

SCREENING COULD SAVE 22 LIVES EVERY 3-5 YEARS

WHAT WOULD LUNG CANCER SCREENING COST FOR VERMONT?

SUBJECTS SCREENED	COST PER LDCT SCAN		
	\$300	\$500	\$700
5,000	\$1,500,000	\$2,500,000	\$3,500,000
7,200	\$2,160,000	\$3,600,000	\$5,040,000
10,000	\$3,000,000	\$5,000,000	\$7,000,000

COST TO TREAT EARLY STAGE (I & II) = \$60,000
 COST TO TREAT LATE STAGE (III & IV) = \$120,000

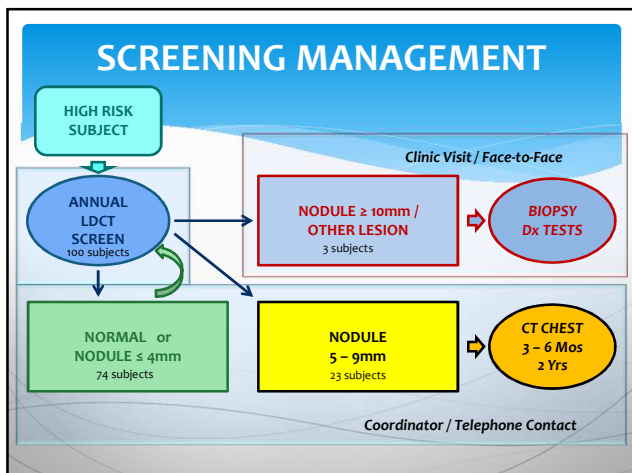
SAVINGS IN DIAGNOSIS & TREATMENT WILL OFFSET SCREENING COSTS

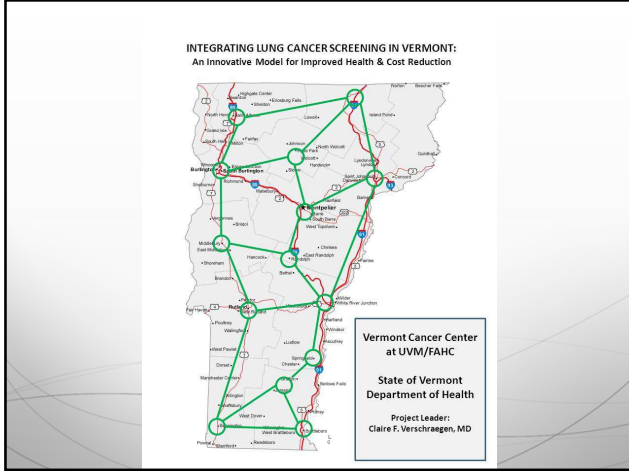


LUNG CANCER SCREENING: **WHAT**

Recruiting ... Screening ... Triage
Diagnosis ... Therapy ... Follow-up

- * **Primary care:** Identification, recruitment, referral
- * **Radiology:** Schedule ... LDCT scan ... Interpretation
- * **Team:** Management algorithm ... triage
- * **Radiology:** Schedule / remind for follow-up scans
- * **Team:** Diagnosis of suspicious lesions
- * **Team:** Complete staging and evaluation of cancer
- * **Team:** Appropriate choices for treatment
 - * (surgery / radiation / chemotherapy / palliative care)
- * **Team:** Follow-up / surveillance / re-treatment

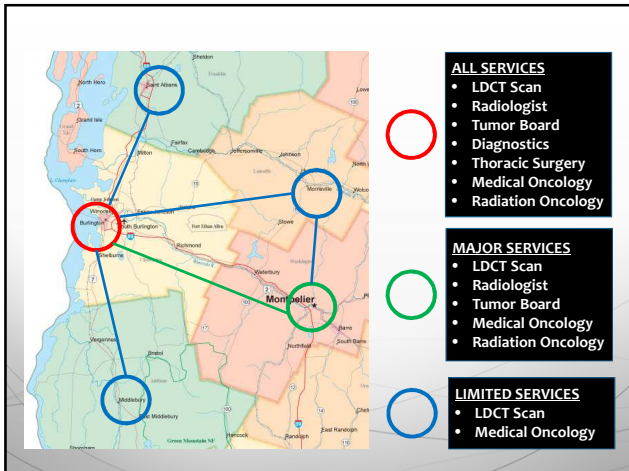




**LUNG CANCER SCREENING: WHERE
14 Hospitals in Vermont**

Most / all have CT scan machine capable of LDCT (protocols available)

- * Some have radiologists able / willing to read LDCT scans
- * Some may wish to set up screening procedures
- * Some have diagnostic options:
 - * Specialized radiology (PET scan, MRI scan)
 - * Percutaneous needle biopsy (CT-guided)
 - * Bronchoscopy (ultra-sound guided)
 - * Cytopathology
- * Some have treatment options:
 - * Thoracic surgery Medical Oncology
 - * Radiation Oncology Palliative Care
- * Few have comprehensive services for all options



Gerry Davis 2013

**THE WISE OLD OWL
SAYS ...**

**LET'S GET STARTED
WITH A LUNG
CANCER SCREENING
PROGRAM!**

LUNG CANCER SCREENING *Controversies*



LUNG CANCER SCREENING **CONTROVERSIES**

- * Can lung cancer LDCT screening work at a community level (radiology / follow-up / cancer care)?
- * Will the reduced mortality found in the National Lung Screening Trial occur in community practice?
- * Will LDCT screening cost more than the savings from treating earlier stage disease?
- * Is lung cancer screening a “better public health investment” than smoking prevention?

LUNG CANCER SCREENING **CHALLENGES**



LUNG CANCER SCREENING **CHALLENGES: Information Resources**

- Information for providers – why, who, how, where?
- * Resources for providers - scheduling, reporting, follow-up;
- * Information for high-risk subjects – why, how, where, when?
- * Acquire accurate tobacco exposure history from subjects;

LUNG CANCER SCREENING

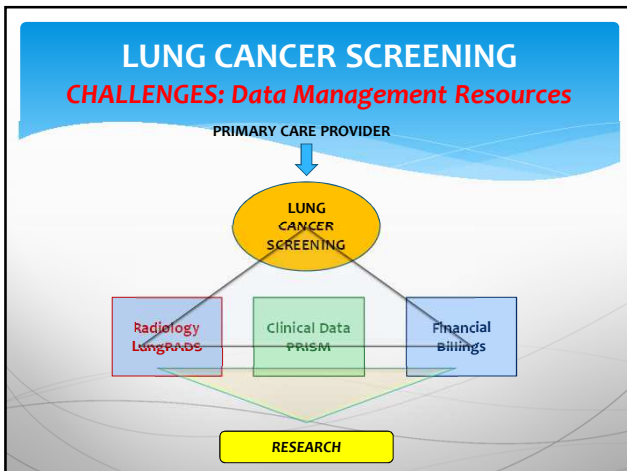
CHALLENGES: Information Resources

- * **Challenge:** Many smokers are lower education / income cohort
- * Develop consumer information materials targeted at lower education / income cohort;
- * **Challenge:** Many people will have “positive” scans ... few will have lung cancer
- * Manage information about high rate of false-positive scans vs low true-positive rate;

LUNG CANCER SCREENING

CHALLENGES: Radiology Resources

- * Establish workable, uniform low-dose CT scan protocols
- * Develop expertise among radiologists to read LDCT scans
- * Establish clear, understandable, uniform reporting vocabulary
- * Establish clear, uniform, minimally invasive protocols for “positive” LDCT scans



LUNG CANCER SCREENING

CHALLENGES: Management Resources

- * Convince state and local administrations that lung cancer screening is:
 - * Good public health
 - * Good business
 - * Good public relations
- * The right procedure ... at the right time ... for the right patient
- * High quality ... High reliability ... High value

LUNG CANCER SCREENING CHALLENGES

- * Develop and oversee performance quality measures
- * Achieve fair value payment for LDCT scans from payers / avoid case-by-case pre-authorization
- * Identify funding for LDCT scans; costs for screening long before savings from early detection
- * Identify funding for administration and coordination of the lung cancer screening program



LUNG CANCER SCREENING OPPORTUNITIES

- * Develop additional tests to improve the specificity of LDCT screening:
 - * Blood Tests
 - * Urine Markers
 - * Exhaled Breath Compounds
 - * Demographic Features
- * **GOAL: Reduce the high false-positive rate!**

LUNG CANCER SCREENING OPPORTUNITIES

- * Evaluate effectiveness of health information materials
 - * Providers / provider support staff
 - * Subjects (gender / education / income / ethnicity)
 - * Media (print / internet / video / social media)

LUNG CANCER SCREENING OPPORTUNITIES

Refine the inclusion criteria to maximize benefit vs risk / cost:

- * Age range (currently 55 – 80 years)
- * Smoking exposure (currently 30 pack-years)
- * Time since smoking cessation (currently 15 years)

* Develop screening criteria for high-risk groups beyond smokers:

- * Asbestos exposure
- * Radon
- * Family history

LUNG CANCER SCREENING OPPORTUNITIES

- * Link screening events to smoking cessation programs;
- * Link screening events to COPD detection / treatment;
- * Use screening cohort as a source for lung cancer research materials:
 - * Blood / urine / exhaled breath
 - * Tumor tissue
 - * Radiology images
 - * Genetic analysis

LUNG CANCER SCREENING

- ... Controversies
- ... Challenges
- ... Opportunities



THE TIME HAS COME

Gerry Davis 2014

THANK YOU !



Gerry Davis 2014