

Medical Surveillance of Asbestos Workers

Steven Markowitz MD, DrPH
City University of New York

“Brazil without Asbestos”
Sao Paulo, Brazil
May 18, 2018

Disclosure

I have provided medico-legal opinions and testimony in asbestos tort lawsuits.

Acknowledgements

Queens College, United Steelworkers, & ATLC

Amy Manowitz MPH

Jim Frederick

Garry Whitley

Ray Beatty

Dennis Lumbao MBA

Amaka OnyekeluEze

Samantha Saenger

Liz Sammarco

United Steelworkers
coordinators

Mary Krutz

Albert Miller MD

Jeffrey Miller MD

Lew Pepper MD

Brett Siegel

Jessica Bigelow

Gabe Cabrera

Meagan Cea

Jennifer Morris

Benefits of Medical Surveillance

1. Right to know
2. Preventive measures – vaccinations; prompt treatment of infections
3. Avoidance of occupational toxins
4. Smoking cessation
5. Compensation

Periodic examination

1. Health questionnaire
2. Spirometry
3. Chest x-ray (one-time CT scan)
4. Smoking cessation
5. Occupational exposure review
6. Stool testing for occult blood

Chest x-ray screening

Table 1. Recommended radiological follow-up schema of asbestos-exposed workers in some countries

Country	Method	Interval	Comment	Reference
UK	"Specific examination of the chest"	At least two years	Health records kept > 40 years from the date of last entry.	Health and Safety, 2012 No. 632. The Control of Asbestos Regulations 2012
US	Chest X-ray	1 to 5 years depending on age and latency	Only required of current workers	OSHA
Japan	Chest X-ray	Twice a year	Present and past workers who handle asbestos and indirectly exposed workers.	Industrial Safety and Health Law

Oksa P, Wolff H, Vehmas T, eds. *Asbestos, Asbestosis, and Cancer: Helsinki Criteria for Diagnosis and Attribution 2014*. Helsinki, Finland: Finnish Institute of Occupational Health; 2014.

Table 1. Recommended radiological follow-up schema of asbestos-exposed workers in some countries

Country	Method	Interval	Comment	Reference
Norway	Chest X-ray	Only first x-ray is compulsory	No systematic national follow-up of asbestos-exposed workers for non-malignant asbestos diseases.	Current employees followed according to EU regulations.
Korea	Chest X-ray	Annually	Retired workers included	Guideline for Health Examination
Germany	Chest X-ray	Every 1 to 3 years	Retired workers included, high risk workers* annual low dose CT	DGUV 2010 (5) Kraus 2014

*Definition of the high risk group in Germany: first exposure before 1985, at least ten years of exposure, more than 30 pack years tobacco smoking, age at least 55 years of age, fit for thoracic surgery, no previous lung cancer.

Identifying and recruiting exposure cohorts

Exposure registry?

DOB 1940, male

Diagnosed with MM 2015

SocHx:

-Smoking: 1ppd x 50 years, quit 3 months ago

-EtOH: 3-6 glasses of hard liquor/night

-Drugs: denies

-Lives with wife

-Worked as a security guard at a computer software facility. Recently let go due to SOB and inability to survey the grounds

Detailed occupational history

Brooklyn Navy Yard, 1961-1964

Forklift repair, 1966-1985

DOB 1946

Diagnosed with MM 2015

Family Social History: Non-Smoker

Father: died of Pancreatic Cancer

Mother: Alive

Occupation: worked with underground piping (PVC)

Detailed occupational history

Sawed and installed Transite asbestos cement pipe, 1960's and 1970's

DOB 1940, female

MSKCC patient

Diagnosed with MM 2015

Social History:

Negative ETOH

She is married with three adult children

She is a retired secretary.

Family History:

She has no known asbestos exposure

Family history is noncontributory.

Detailed environmental history

Husband was carpenter, 1962-1999

Identifying and recruiting exposure cohorts

Exposure registry?

Malignant mesothelioma

Research on early detection

Who should be screened
with low dose CT scan?

Lung cancer and asbestos

Asbestos causes lung cancer among non-smokers

1. Hammond, 1979 5-fold increase in risk
2. Berry, 1985 7-fold increase in risk
3. Wang, 2012 7-fold increase in risk
4. Markowitz, 2013 5-fold increase in risk

Lung cancer and asbestos

Asbestos w/o asbestosis causes lung cancer

1. Berry, 1985 7-fold increase in risk
2. Wang, 2012 7-fold increase in risk
3. Markowitz, 2013 5-fold increase in risk

2010

National Cancer Institute randomized controlled trial shows low dose CT scanning reduces lung cancer deaths by at least 20%.

2010

National Lung Screening Trial (NCI)

Eligibility criteria:

55 to 74 years old

≥ 30 pack-years smoking

≤ 15 years since smoking cessation

2013

U.S. Insurance plans and Medicare pay for low dose CT for lung cancer screening.

Criteria: 55 to 80 year-olds

\geq 30 pack-years smoking

\leq 15 years since smoking cessation

Occupation?

2013

U.S. Insurance plans and Medicare pay for low dose CT for lung cancer screening.

Criteria: 55 to 80 year-olds

\geq 30 pack-years smoking

\leq 15 years since smoking cessation

Occupation

2014



National
Comprehensive
Cancer
Network®

National Comprehensive Cancer Network

NCCN

2014

NCCN recommendations for LDCT lung cancer screening

Criteria #1: ≥ 55 years old

≥ 30 pack-years smoking

≤ 15 years since smoking cessation

Criteria #2: ≥ 50 years old

≥ 20 pack-years smoking

1 other risk factor for lung cancer

2014

NCCN recommendations for LDCT lung cancer screening.

Criteria #1: ≥ 55 years old

≥ 30 pack-years smoking

≤ 15 years since smoking cessation

Criteria #2: ≥ 50 years old

≥ 20 pack-years smoking

1 other risk factor for lung cancer

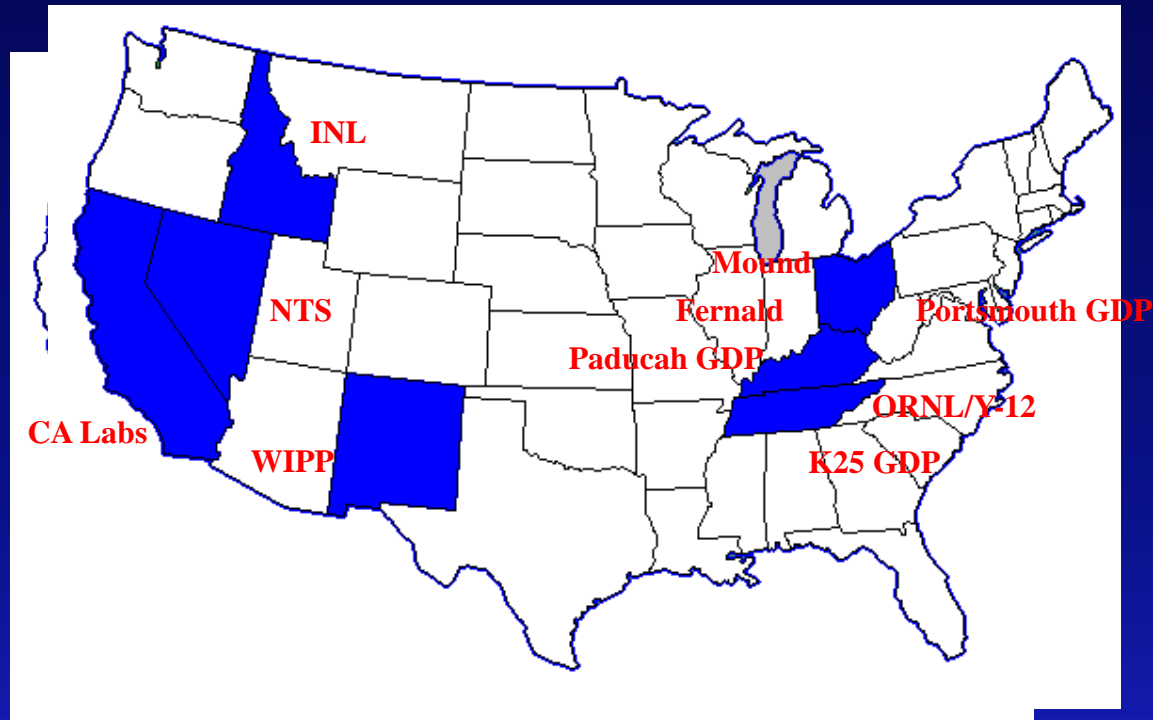
NCCN Recommendations

Other risk factors for lung cancer

- Occupational exposures (asbestos, silica, etc)
- Family history
- COPD, other chronic respiratory diseases
- Radon exposure



Worker Health Protection Program



United Steelworkers, ORNL/Y-12 Atomic Trades and Labor Council
Fernald Atomic Trades and Labor Council
Queens College, City University of New York

*Yield of Low Dose CT Screening for Lung Cancer
in high risk workers: the case of 7,189 US
Nuclear Weapons Workers*

Accepted for publication, AJPH

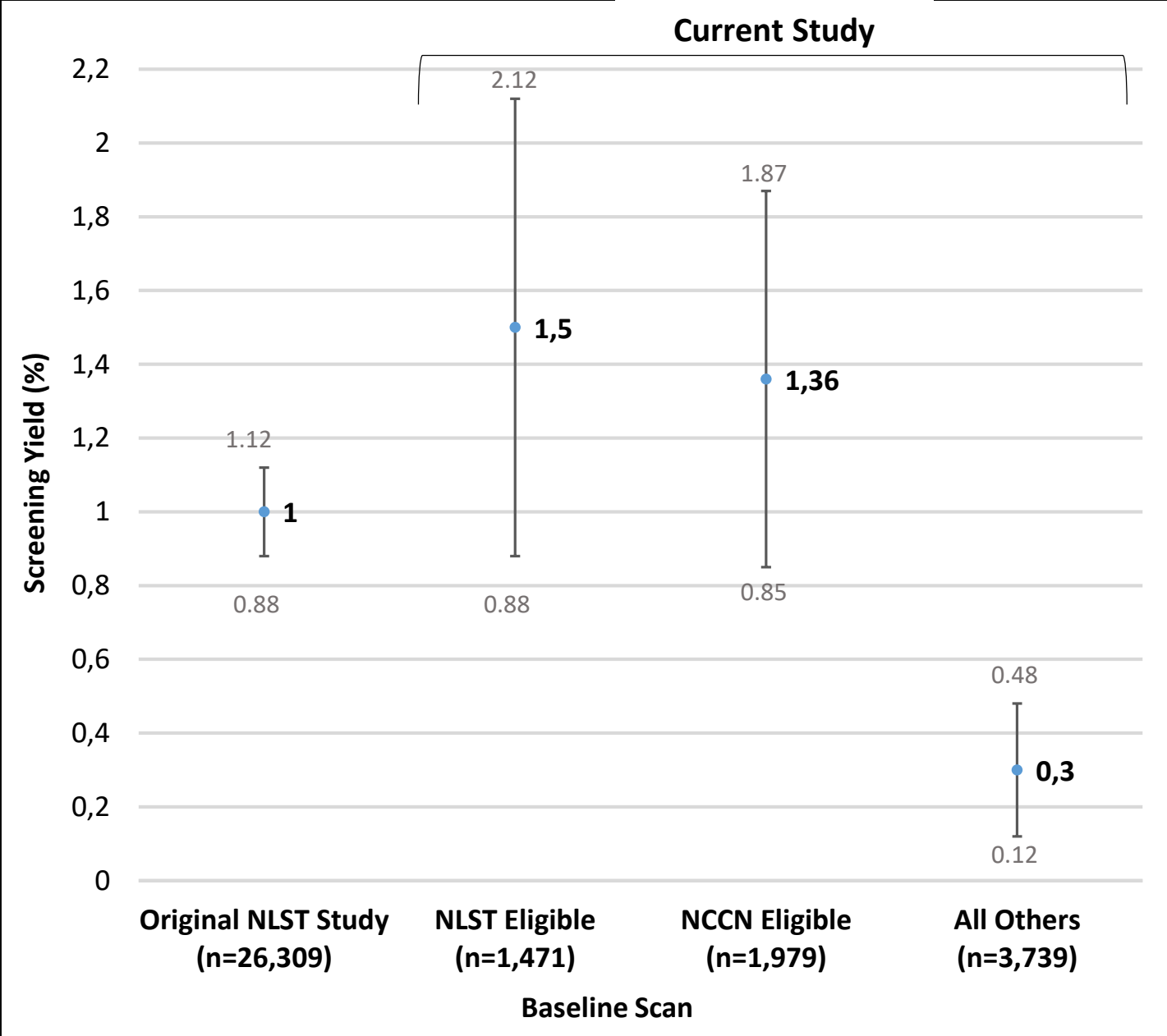
WHPP eligibility criteria for smokers (n=7,189)

- 50 to 80+ years old
- Positive history of smoking
- No limit on time since smoking cessation
- Work in production/maintenance, or lab in nuclear weapons industry

WHPP Study Population

Age/Gender	Mean age (years)	65 (9.4)
	Male/female (%)	88/12
Smoking	Current smokers	20%
	Mean pack-years	29 (23.3)
	Former smokers, mean time since quit	24 (14.1)

LC Screening Yield on Baseline Scan, DOE Workers



2016

NCI re-visits the issue

Risk-based vs. NLST-based criteria

NCI, 2016



- Used risk models based on PLCO, NLST and NHIS data
- “Risk-based” criteria included COPD, family history, and more former smokers than currently recommended criteria
- Showed “risk-based” eligibility criteria averted 20% more LC deaths than NLST-based criteria

NCI study, 2018

“To better capture high-risk smokers and prevent premature deaths from lung cancer, eligibility for lung cancer screening should be based on reaching a cost-effective risk threshold that balances CT screening benefits and harms by using a lung cancer risk tool validated in the U.S. population.”

Cheung LC et al. Ann Int Med. 2018

Preventing Lung Cancer Mortality by Computed Tomography Screening: The Effect of Risk-Based Versus U.S. Preventive Services Task Force Eligibility Criteria, 2005-2015.

Supports the view that the level of LC risk is the key to who should be screened, not the specific profile of risk factors that determine that risk

Lung cancer risk calculators

MSKCC: age, gender, pk-yrs, #quit years, asbestos

AATS: age, gender, BMI, education, pk-yrs, quit-years, FH, EM, asbestos

ALA, ATS age, pk-years, #quit years

We can now detect and cure
the most common cause of
occupational disease mortality.

Lung cancer

Steven Markowitz MD, DrPH

smarkowitz@qc.cuny.edu