


## Partnering to Transform Early Detection of Lung Cancer

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9/23/2022 AHCI Symposium



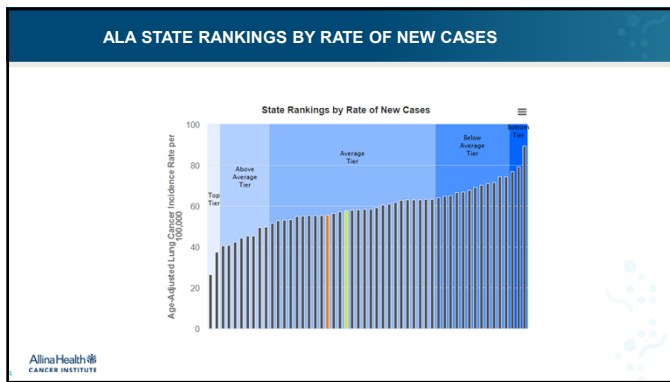
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### CONTENT

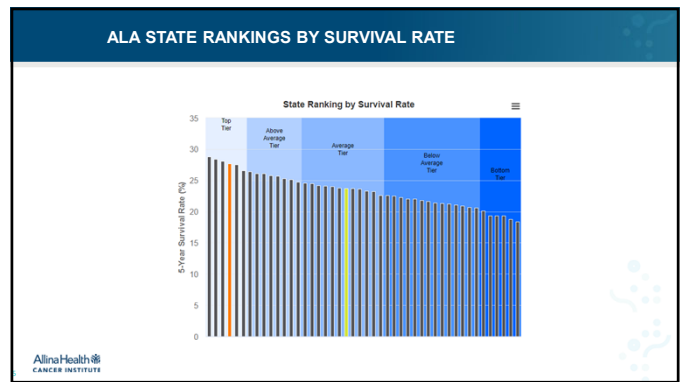
- State of Lung Cancer
- Lung Cancer Screening- the evidence
  - NLST
  - NELSON
- USPSTF 2021 and CMS 2022 Guidelines
- It is more than LDCT
  - SDM in Primary Care
  - Removing care delivery barriers



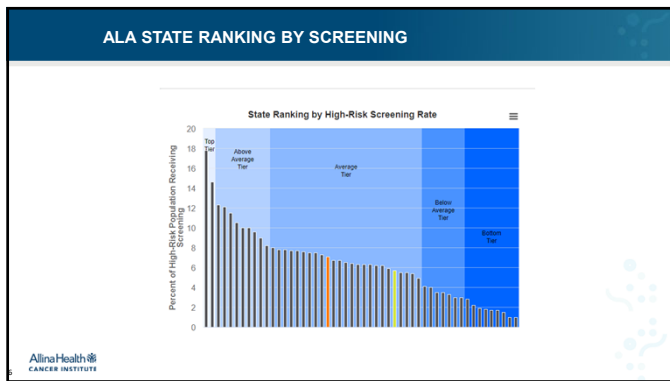
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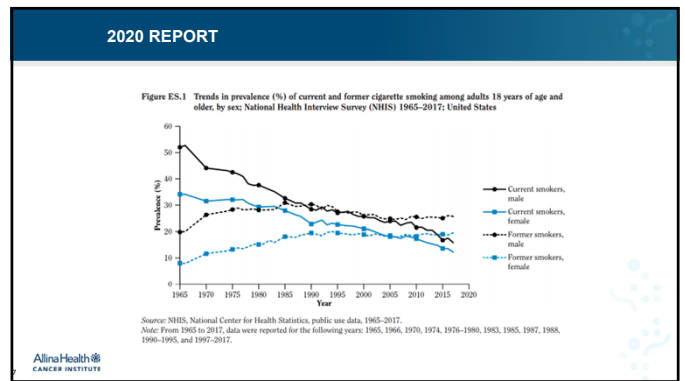
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7

### THE EFFECT OF ADVANCES IN LUNG-CANCER TREATMENT ON POPULATION MORTALITY. HOWLANDER ET AL. NEJM 2020;383:640-9

- Describe trends in mortality amongst patients with different subtypes of lung cancer in the context of changing incidence and survival patterns in the US general population
  - NSCLC-**
    - Mortality decreased faster than incidence
    - That corresponded to the timing of approval of targeted therapy
    - Noted both amongst men and women, across all races and ethnic groups
  - SCLC-**
    - Mortality decrease related almost entirely to declining incidence with no improvement in survival
    - Correlates with limited advances in the time frame examined

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### NSCLC- TRENDS IN INCIDENCE AND INCIDENCE-BASED MORTALITY

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### REDUCED LUNG-CANCER MORTALITY WITH LOW-DOSE COMPUTED TOMOGRAPHIC SCREENING (NLST)

ABERLE ET AL. NEJM 2011;365:395-409

- Prospective randomized trial
- 53,454 individuals at high risk
- 1:1 randomization LDCT and CXR – detection of pulmonary nodules
- 3 annual screens- T0, T1, T2
- Criteria-
  - 55-74 years old
  - ≥30 pack year history of smoking
  - active smokers or quit within 15 years
- Screening adherence 90%**
- Primary endpoint- lung cancer mortality
- Of note- no defined management algorithm
- Blacks 4.4%**

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### NLST 2011

	LDCT	CXR	
Positive screening test	24.2 % Nodule ≥4 mm	6.9 % Any non calcified nodule	<ul style="list-style-type: none"> <li>Biaxial measurement</li> <li>Relative reduction of mortality from LC with LDCT screening of 20% (95% CI 8.8-26.7)</li> <li>Rate of death from any cause was reduced in LDCT group by 6.7% (95% CI 1.2-13.6)</li> <li>Adherence 95% in LDCT group vs 93% in CXR group over 3 rounds</li> <li>NNS 1:320</li> </ul>
False positive – a “mismomer”	96.4 %	94.5 %	
Incidence of LC per 100,000 person years	645	572	
Number of deaths from LC per 100,000 person years	247	309	
A person years			

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### LUNG CT SCREENING REPORTING AND DATA SYSTEM (LUNG-RADS) 2014 AND 2019

- 2014 size threshold of nodule that would trigger a positive exam to ≥6 mm mean diameter
  - Considerable increase in PPV

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### BENEFITS AND HARMS OF COMPUTED TOMOGRAPHY LUNG CANCER SCREENING STRATEGIES: A COMPARATIVE MODELING STUDY FOR THE USPSTF

KONING ET AL. ANN INTERN MED 2014;160:311-320

- 576 scenarios with varying eligibility criteria (age, pack years of smoking, years since quitting) and screening intervals
  - Valuable tools to project trial results to different screening scenarios that provide greatest benefit for a specified level of resources
- Scenarios assumed 100% screening adherence- high quality screen**
- Short trials extrapolated to lifetime of follow up
- Extrapolations to age spans of 75-80 years
- Demonstrated 14% reduction in lung cancer mortality
- USPSTF Grade B recommendation-
  - to screen individuals 55-80 years annually with other criteria remaining the same
  - 10.5 million eligible for screening (cf 8.6 million based on NLST criteria)

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### REDUCED LUNG-CANCER MORTALITY WITH VOLUME CT SCREENING IN A RANDOMIZED TRIAL. NELSON TRIAL

KONING ET AL. DOI: 10.1056/NEJM0A1911793

- Prospective randomized trial
- 13,105 men, **2595 women at high risk**
- 1:1 randomization LDCT vs no screening
- 4 screens- T0, T1, T3 and T5.5 years, follow up for 11 years**
- Volume and Volume Doubling Times**
- Criteria-
  - 55-74 yo
  - >10 cigs/d for 30 years, >15 cigs/d for 25 years
  - active smokers or quit within 10 years
- Screening adherence 90%**
- Primary endpoint- lung cancer mortality
- Percentage of patients with positive tests-
  - NELSON 2.1% (PPV 43.5%)
  - NLST 24% (PPV 3.8%)
- Lower stage and mainly surgical treatment

**A. Lung Cancer Incidence**  
 Y-axis: Cases per 100 Persons Yr. X-axis: Years since Randomization (0-11).  
 Screening group (blue) shows lower incidence than control group (red).

**B. Lung Cancer Mortality**  
 Y-axis: Deaths per 1000 Persons Yr. X-axis: Years since Randomization (0-11).  
 Screening group (blue) shows lower mortality than control group (red).

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### NELSON TRIAL

NEJM 2019

- MALES at high risk for lung cancer have a reduced risk of dying from lung cancer of 26% in the screen arm compared to the male control arm (95% CI 9-40%)**
- In WOMEN, reductions are consistently more favorable: 39-61%**
- These results are more favorable than the NLST-results & suggest gender differences**
- Volume CT lung cancer screening of high risk former and current smokers results in low referral rates (2.3%), and a very substantial reduction in lung cancer mortality (in both genders)**

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### LUNG SCREENING BENEFITS AND CHALLENGES: A REVIEW OF THE DATA AND OUTLINE FOR IMPLEMENTATION.

SANDS ET AL. J THORAC ONCOL 2021;16(1):37-53

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### STAGE SHIFTS AND SURVIVAL

- Dec 2013 – USPSTF guidelines approving LDCT for LCS
- US Oncology Databases- NCDB and SEER
  - between 2010 and 2018
  - Over 750,000 patients with NSCCA diagnosis
  - Rates of change in early diagnosis and survival increased starting around 2014
  - In 2018, for the first time, white patients more often received diagnoses of stage I than of stage IV NSCLC; however, stage IV cases continued to exceed stage I cases in other ethnic groups
- Thus-
  - Stage shift
  - Survival
  - Disparity

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### PERCENTAGE OF PATIENTS DIAGNOSED WITH STAGE 1 NSCLC

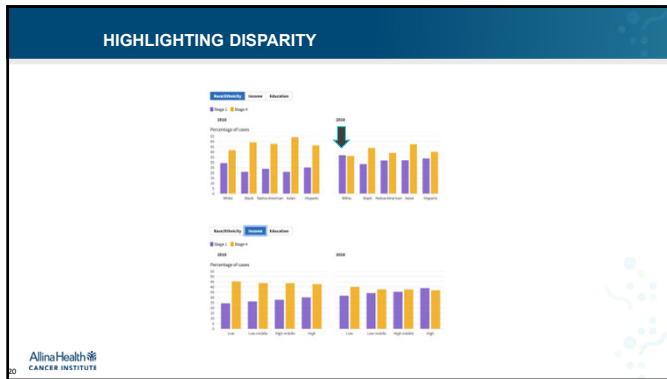
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### PERCENTAGE AND SURVIVAL OF PATIENTS WITH STAGE 1 NSCCA BASED ON HIGH AND LOW SCREENING STATES

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20

### USPSTF RECOMMENDATION STATEMENT

JAMA. 2021;325(10):962-970. DOI:10.1001/JAMA.2021.1117

- Age 50-80 years and
- 20 pack year history of smoking and
- Currently smoke or have quit within the past 15 years
- To be discontinued if once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery

It is a **Grade B recommendation**- moderate certainty of moderate benefit in high risk patients

- High quality screen

- CMS Decision Memo 2022

21

21

### RACIAL AND SEX DISPARITIES

USPSTF 2021

- Reduce racial disparities-
  - Increase relative percentage of people who qualify by 87%
    - 78% in non Hispanic Whites
    - 107% in non Hispanic Black
    - 112% in Hispanic
    - Still fewer African American will qualify compared with white 27% vs 36%
- Reduce sex disparities-
  - Men 80% and women 96%
- Risk prediction models vs risk factor based screening
  - Shifted screening to older people
  - Complex models a barrier to implementation and uptake
  - No prospective studies (ILST – prospective cohort study- PLCom2012 model against USPSTF 2013 criteria)

22

22

### TAKE HOME POINTS

- Two RCTs support LCS- the data is in fact transformative
- The science is sure to evolve
- USPSTF 2021 criteria-
  - Grade B recommendations
  - Vastly increase number of people eligible for screening
  - Attempt to reduce racial and sex based disparities
- CMS Decision Memo 2022

23

23

### SHARED DECISION MAKING VISIT IN PRIMARY CARE

- Improved access to shared decision making process when completed during annual visit or any other primary care related visit.
- Primary Care is accustomed to this type of patient centered screening decision making

24

24

### REMOVING BARRIERS TO CARE DELIVERY

- Patient Identification
  - Health Maintenance or Care Gap notifications during time of care delivery.
  - Based on USPSTF Clinical Guidelines
- SmartSet
  - Efficient ordering, documentation and billing

25

25

## HUB (CENTRALIZED) RESULT MANAGEMENT AND SPECIALTY ACCESS

- RN management of results including
  - Notification, education, follow up plan
    - Improved adherence to ongoing screening
    - Time savings for provider and primary care team impacts ability to screen more patients
- Specialty Access
  - Streamlined access to pulmonary services

## IN SUMMARY

The data and guidelines support screening patients with a SDM model.

Removing barriers in Primary Care to allow screening of eligible patients requires EMR based support and Centralized result management.

