Equity Issues with Lung Cancer Screening
Prevent Cancer - Quantitative Imaging Workshop

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UI Health | UIC

UIC UNIVERSITY OF ILLINOIS CANCER CENTER
Bench to Community

No Disclosures

Equity Issues with Lung Cancer Screening: Today's Focus

- Discuss UIC's lung cancer screening program and how it relates to health disparities.
- Identify components of a successful screening program for minority and underserved populations.
- Discuss screening eligibility and how it may need to be altered for programs that serve primarily minority populations.

Lung Cancer Screening and Health Disparities

Lung Cancer and Health Disparities

Smoking

- Rates are highest among:
  - **Race/Ethnicity:** American Indians and Alaskan Natives 26.1%, White 19.4%, Black/African Americans 18.3%, Hispanics 18%
  - **Education Status:** no diploma 27.1%, high school 21.7%, some college 20%, college degree 9.1%
  - **Poverty Status:** Below poverty level 26%, at or above poverty level 14%
- Cigarette advertising is targeted at minorities
- Minorities are least likely to be screened for smoking by primary care providers and receive smoking cessation resources

Lung Cancer

- Black/African Americans (AA):
  - AA men have the highest incidence and mortality of lung cancer
  - More likely to smoke longer in years but less cigarettes per day
  - More likely to smoke menthol (more addictive)
  - More likely to be diagnosed at a late stage

AMERICAN LUNG ASSOCIATION, IDPH 2010; AMERICAN JOURNAL OF PUBLIC HEALTH 2015,

Social Determinants of Health

Interplay Between Host, Agent, And Environment

Health Care

Housing

Food

Built Environment

Community

Domestic Violence & Crime

Pollution

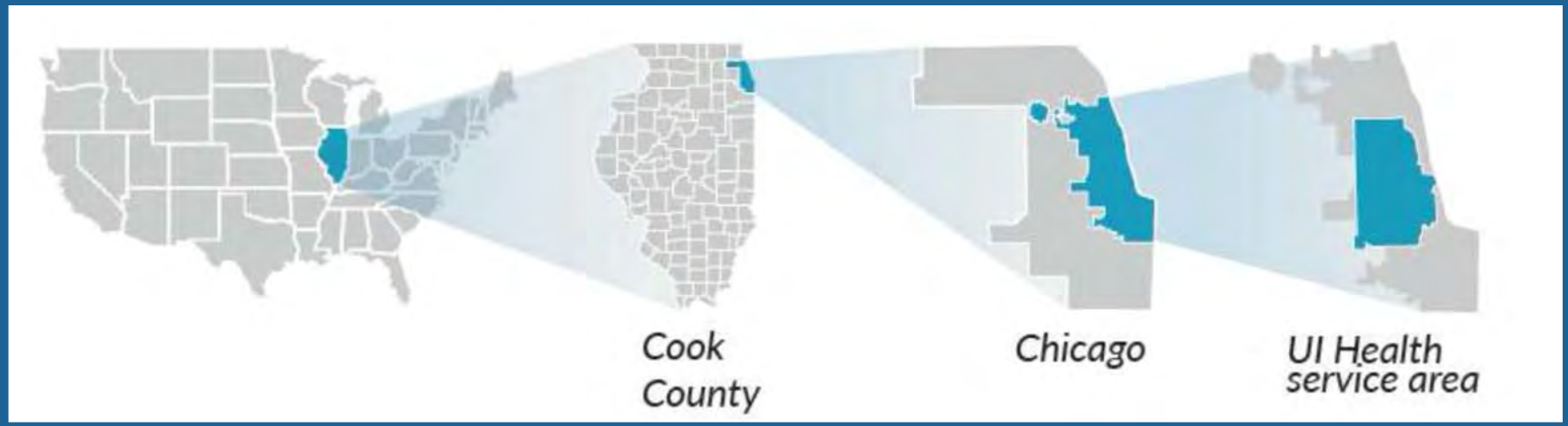
Employment

Education

Governance

Economic Stability

UIC's Lung Cancer Screening Program

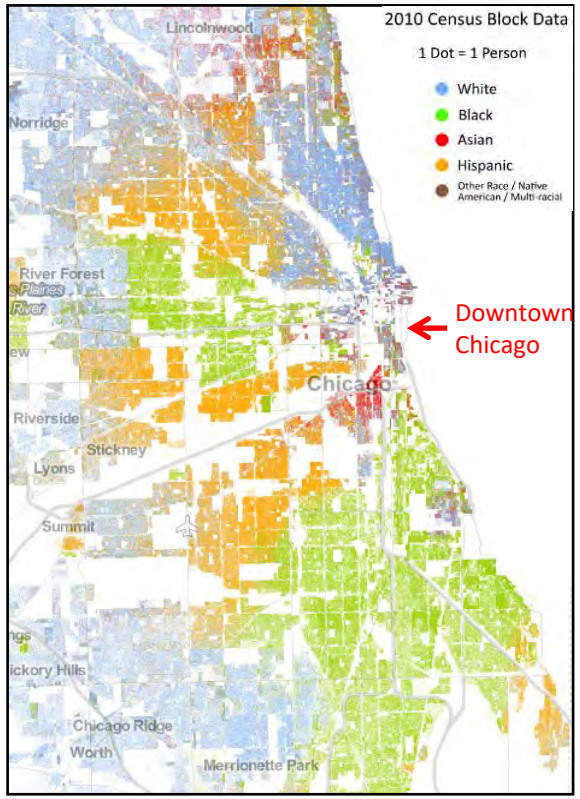


Disparities in Chicago

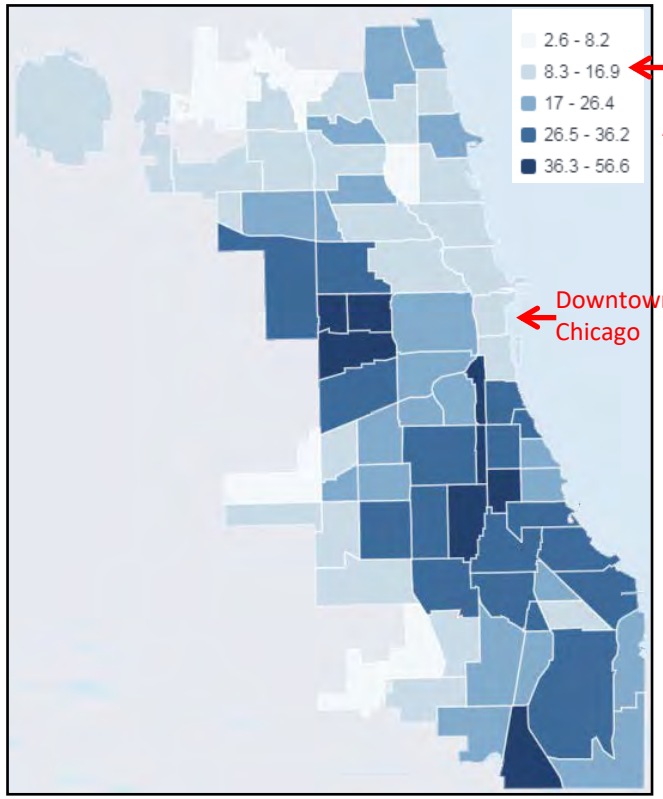
Chicago:
2.7 million

45% White
33% Black

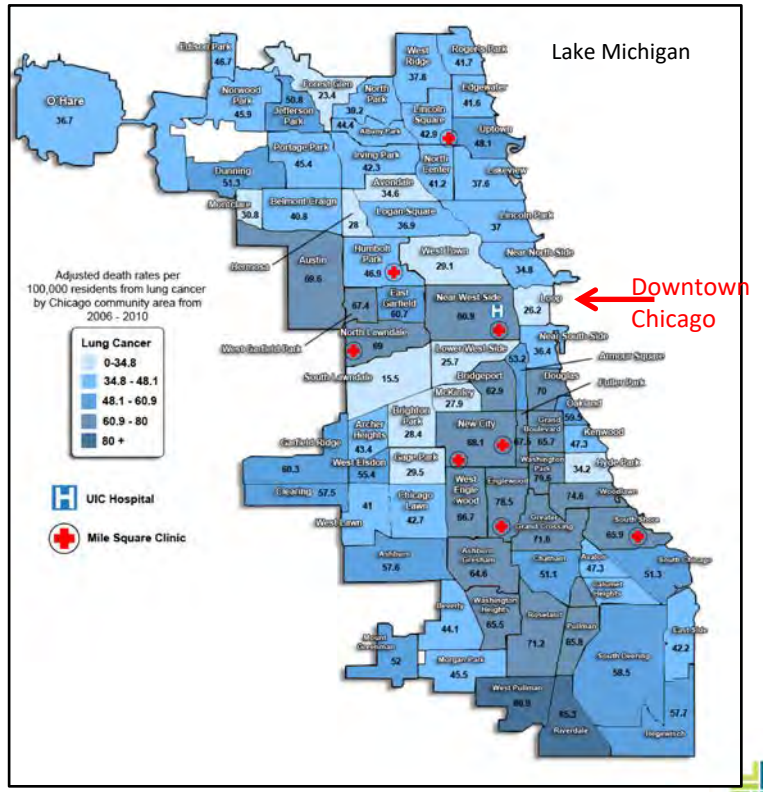
Racial & Ethnic Group Distribution



Poverty Distribution

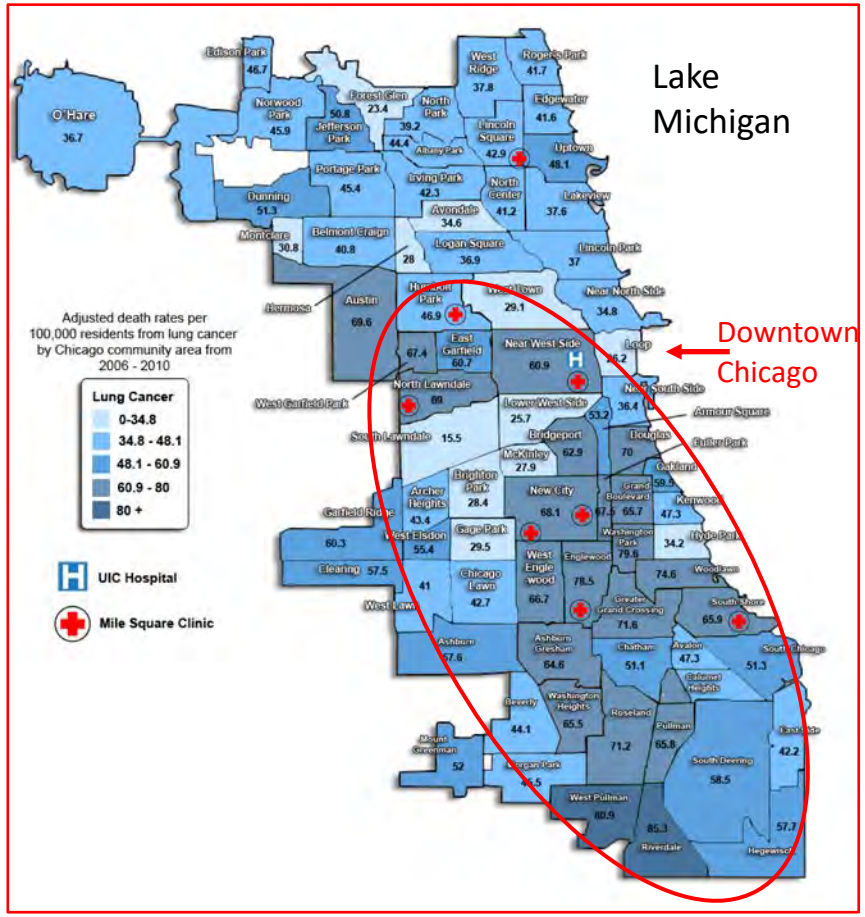


Lung Cancer Mortality Rates

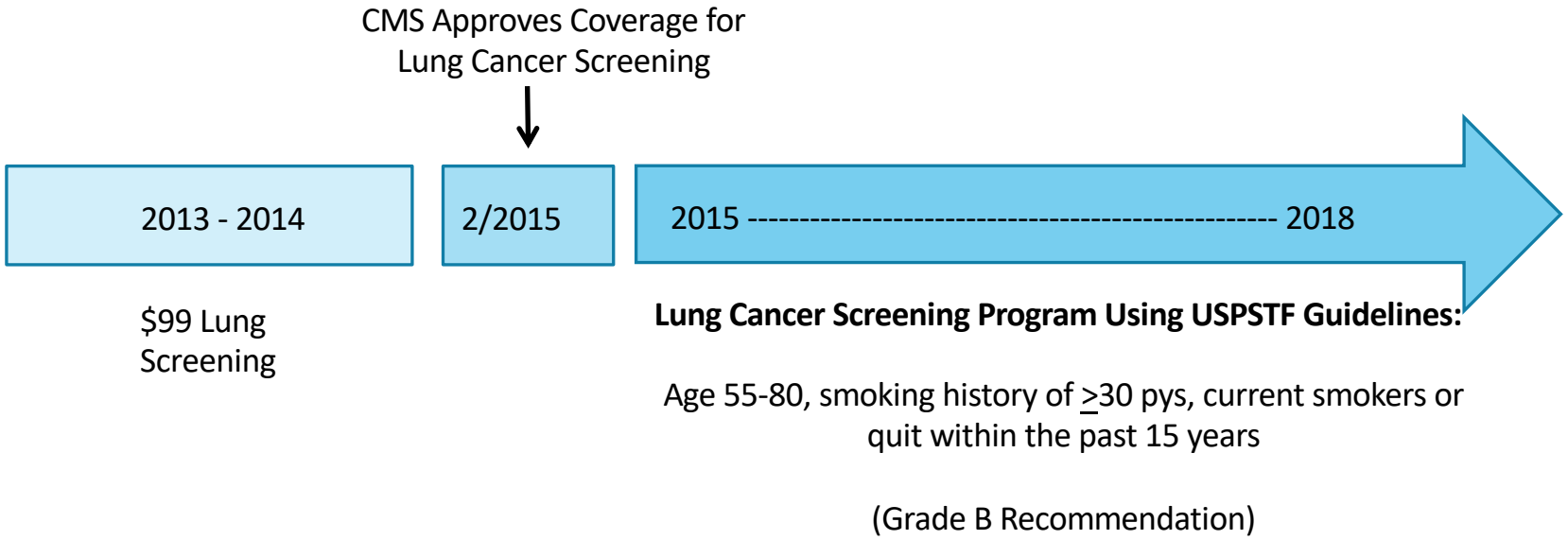


Lung Cancer Mortality and UIC's Service Area

- 24 community areas in the West and South-side of Chicago
- 495 bed hospital, 22 outpatient clinics, and a network of 15 FQHCs (Mile Square)



History of Lung Cancer Screening Program at UIC



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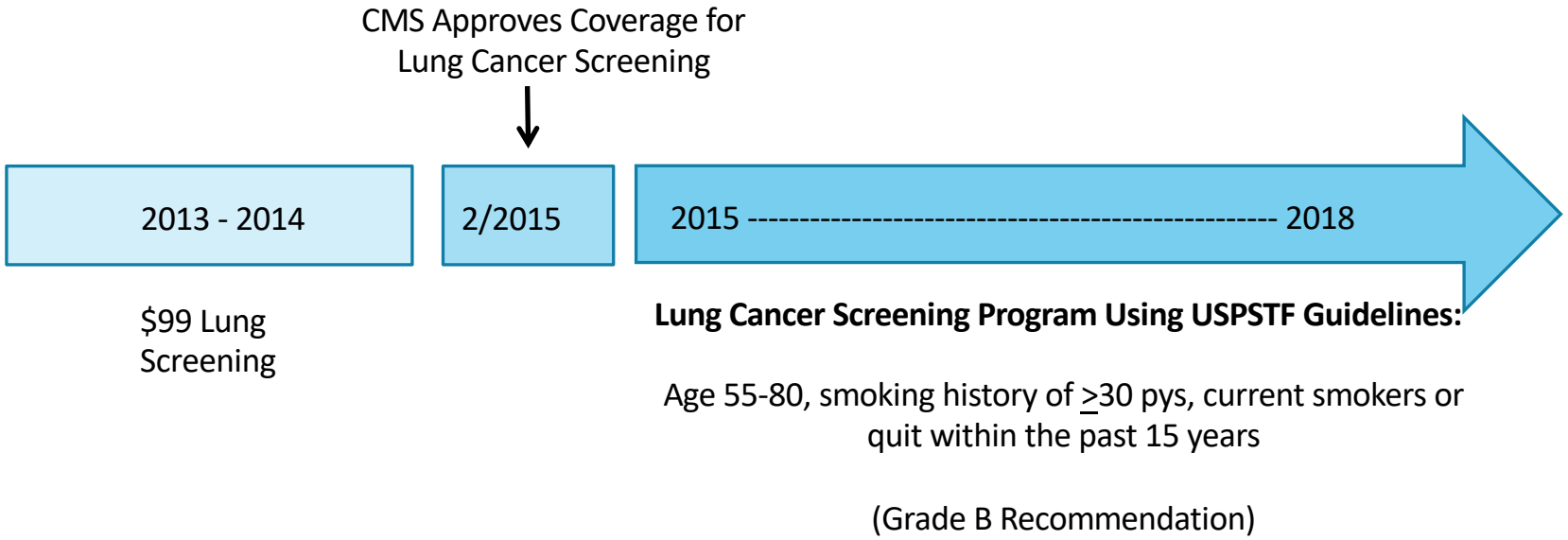

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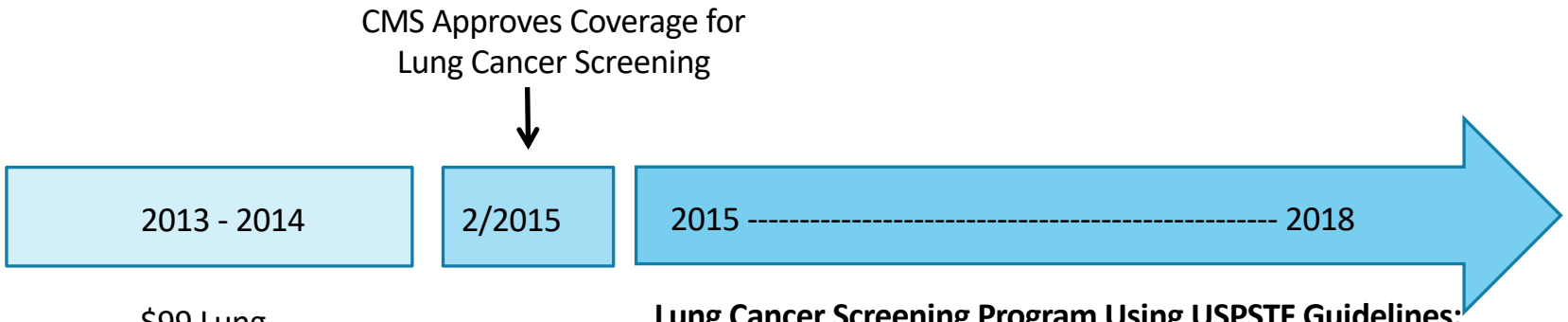
History of Lung Cancer Screening Program at UIC



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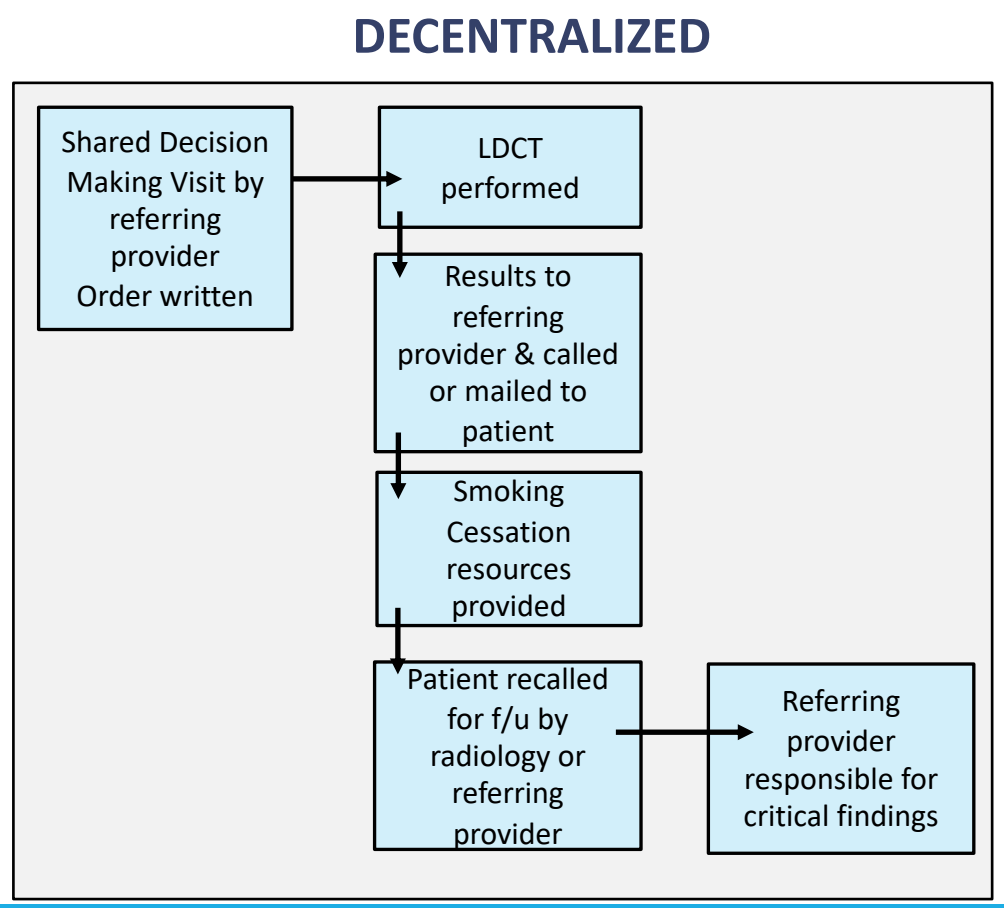
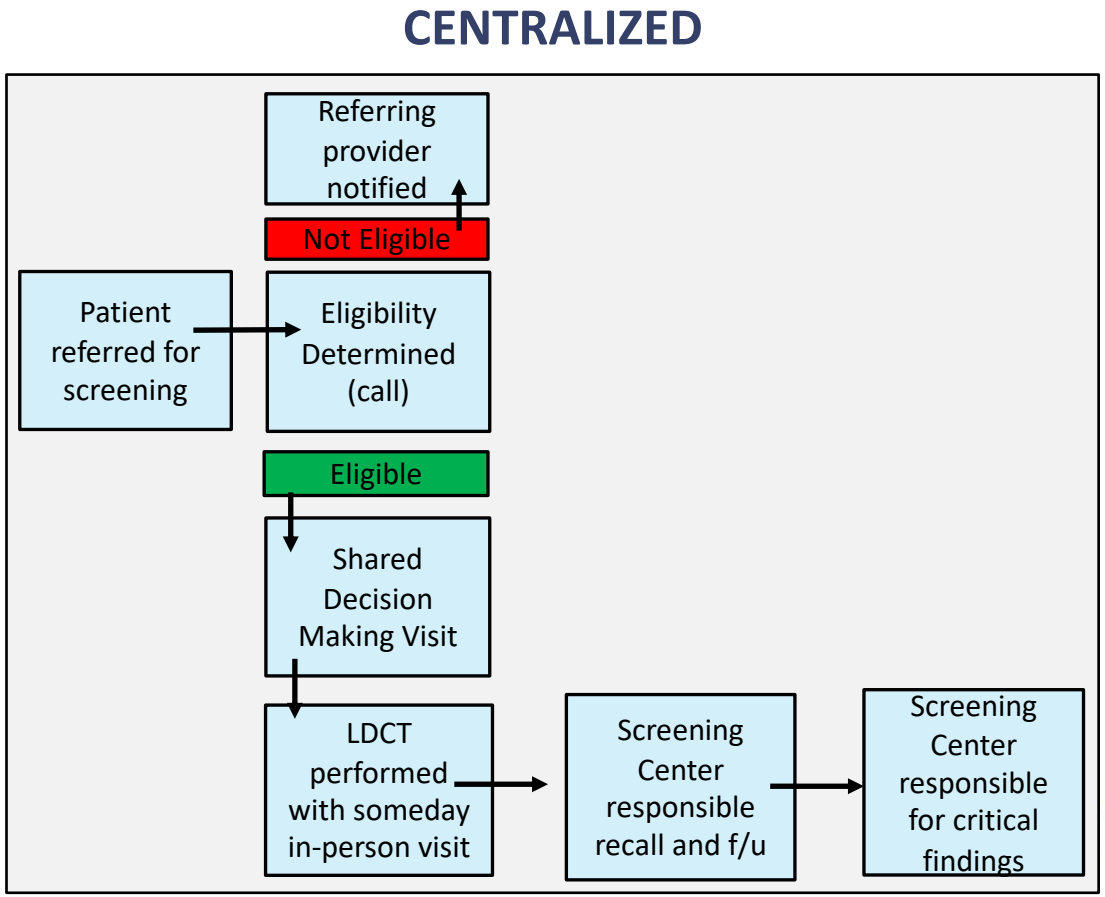
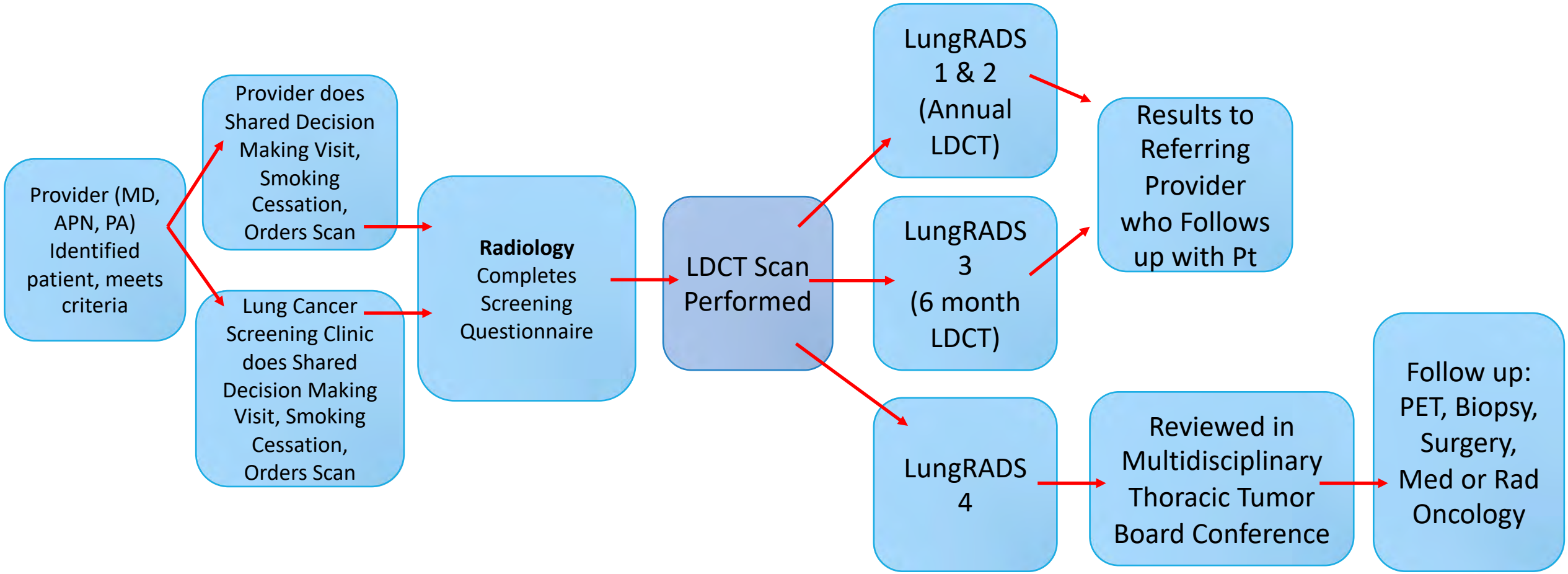
750+

Lung Screening Models
Decentralized vs Centralized





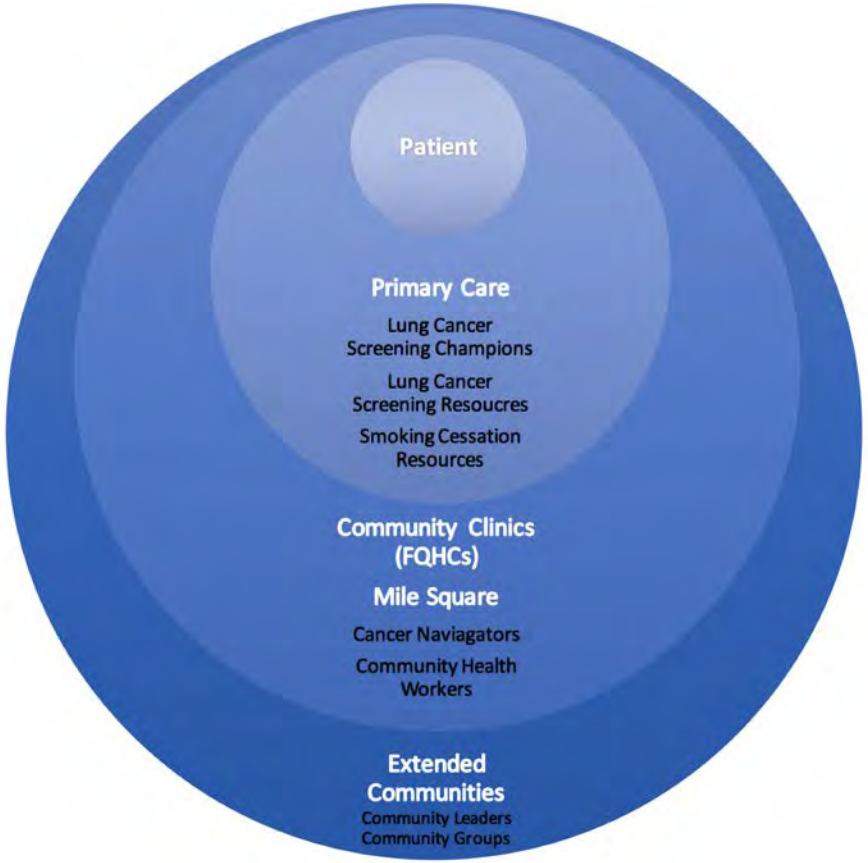
Current UIC's Lung Cancer Screening Workflow



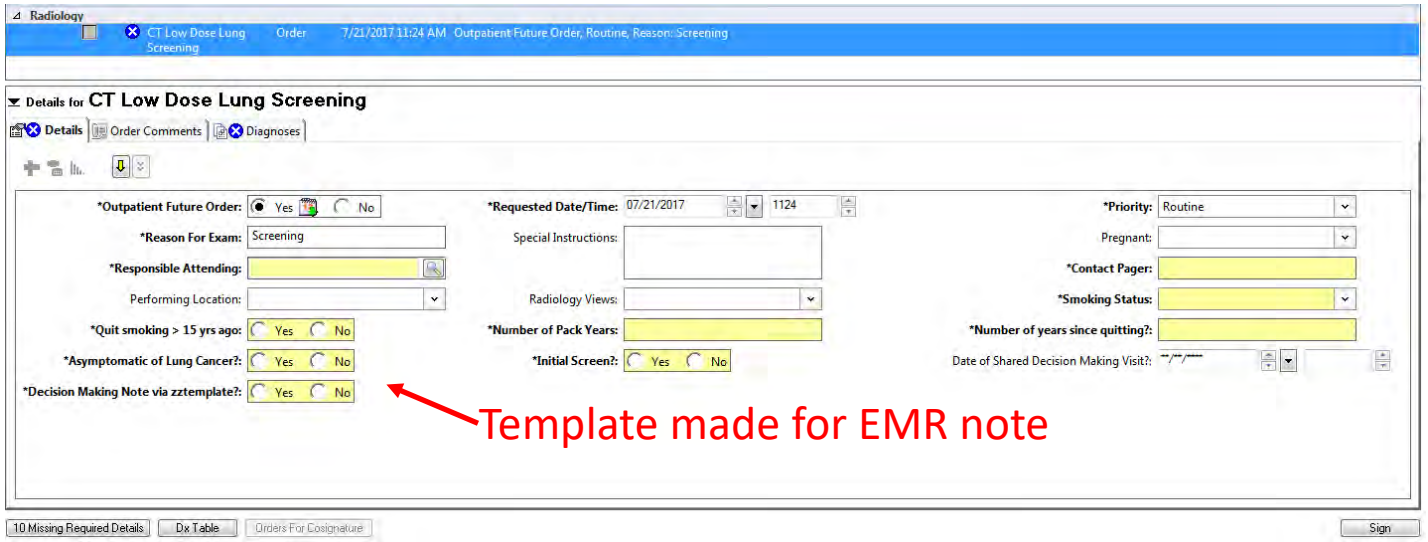
Physician Engagement – A Key to Lung Cancer Screening

1. Get Physicians/APNs/PA/RNs involved early, listen to them
2. Give them the Big Picture
3. Support with Structure and Resources
4. Listen and Communicate
5. Continue to Evolve the Process
6. Keep them Informed of the Process and Outcomes

UIC
From Patient to Community Engagement



Low-Dose Lung Screen Order Embedded with Criteria, Template



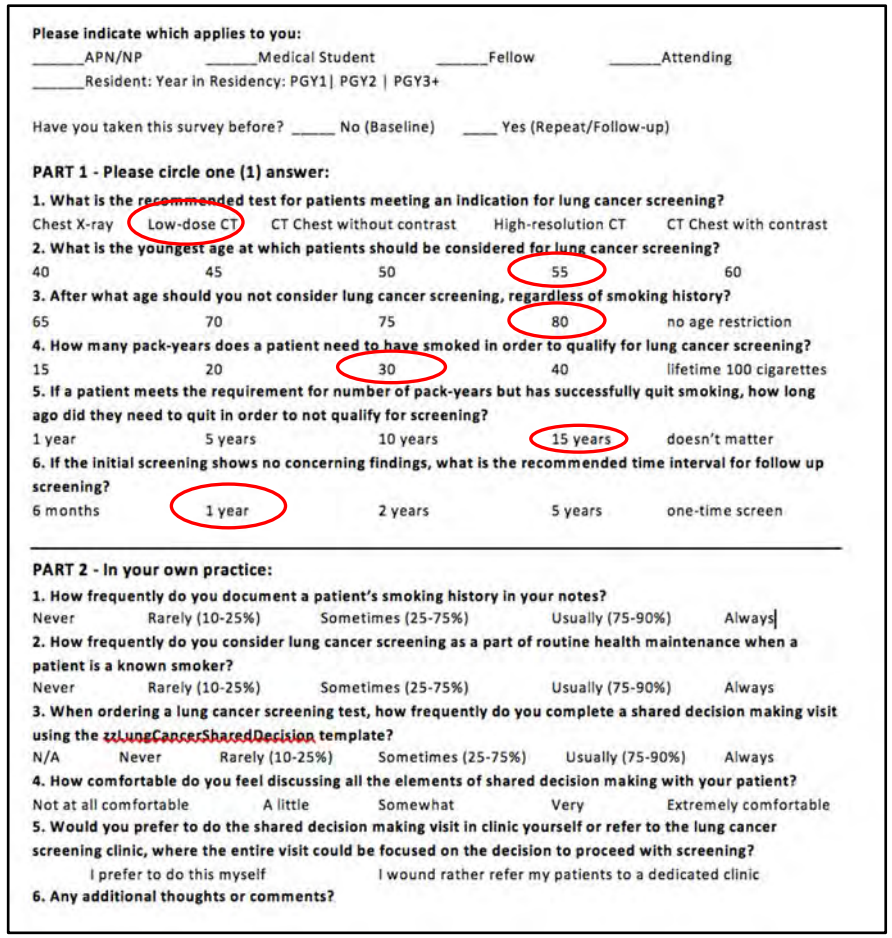
Lung Cancer Shared Decision Making Visit:

Smoking Status ____Current _____Former. If former quit_____(year)

Smoked _____cigarettes/day x _____years. _____pack-year history

Discussed current USPSTF (or CMS) guidelines and eligibility for annual lung cancer screening with low-dose CT. Discussed risks/benefits including false positives, over-diagnosis, possible need for further testing, radiation exposure. Counseled on importance of smoking cessation and adherence to annual lung cancer screening until patient no longer meets criteria, co-morbidities prevent a patient from being screened, or by patient choice. Pt is asymptomatic of lung cancer and willing to undergo further testing and treatment if lung cancer is detected.

Quality Improvement Project to Improve Knowledge and Lung Cancer Screening in Primary Care Clinics



Please indicate which applies to you:

_____APN/NP _____Medical Student _____Fellow _____Attending

_____Resident: Year in Residency: PGY1| PGY2 | PGY3+

Have you taken this survey before? _____ No (Baseline) ____ Yes (Repeat/Follow-up)

PART 1 - Please circle one (1) answer:

1. What is the recommended test for patients meeting an indication for lung cancer screening?

Chest X-ray | Low-dose CT | CT Chest without contrast | High-resolution CT | CT Chest with contrast

2. What is the youngest age at which patients should be considered for lung cancer screening?

40 | 45 | 50 | 55 | 60

3. After what age should you not consider lung cancer screening, regardless of smoking history?

65 | 70 | 75 | 80 | no age restriction

4. How many pack-years does a patient need to have smoked in order to qualify for lung cancer screening?

15 | 20 | 30 | 40 | lifetime 100 cigarettes

5. If a patient meets the requirement for number of pack-years but has successfully quit smoking, how long ago did they need to quit in order to not qualify for screening?

1 year | 5 years | 10 years | 15 years | doesn't matter

6. If the initial screening shows no concerning findings, what is the recommended time interval for follow up screening?

6 months | 1 year | 2 years | 5 years | one-time screen

PART 2 - In your own practice:

1. How frequently do you document a patient's smoking history in your notes?

Never | Rarely (10-25%) | Sometimes (25-75%) | Usually (75-90%) | Always

2. How frequently do you consider lung cancer screening as a part of routine health maintenance when a patient is a known smoker?

Never | Rarely (10-25%) | Sometimes (25-75%) | Usually (75-90%) | Always

3. When ordering a lung cancer screening test, how frequently do you complete a shared decision making visit using the zzLungCancerSharedDecision template?

N/A | Never | Rarely (10-25%) | Sometimes (25-75%) | Usually (75-90%) | Always

4. How comfortable do you feel discussing all the elements of shared decision making with your patient?

Not at all comfortable | A little | Somewhat | Very | Extremely comfortable

5. Would you prefer to do the shared decision making visit in clinic yourself or refer to the lung cancer screening clinic, where the entire visit could be focused on the decision to proceed with screening?

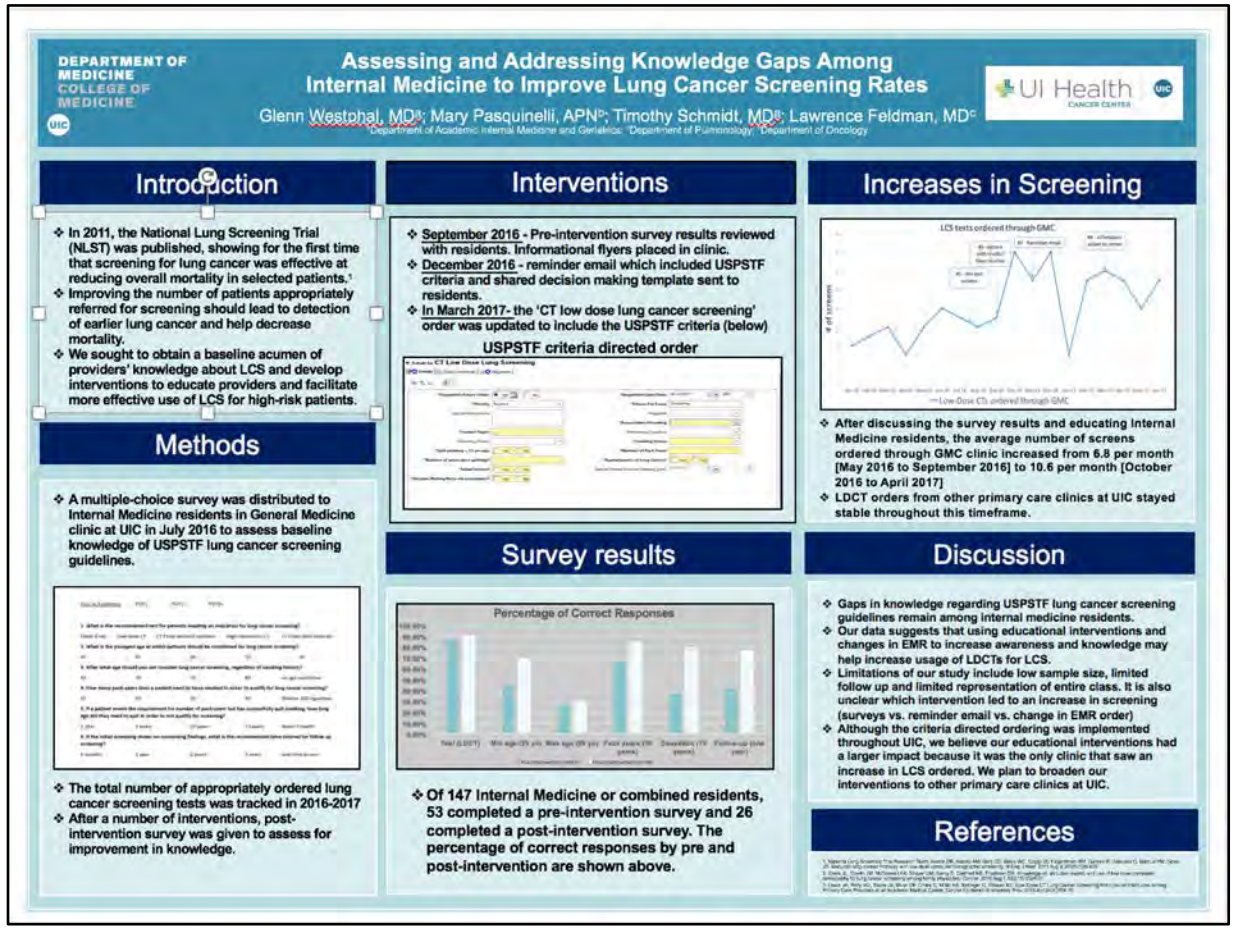
I prefer to do this myself | I wound rather refer my patients to a dedicated clinic

6. Any additional thoughts or comments?

Interventions:

- Faculty meetings, lecture series, Grand Rounds
- Lung Cancer Screening "Champion" at resident and attending level
- Placing Lung Cancer Screening information flyers/resources in clinics
- Reminder emails
- Lung cancer navigators in Mile Square Clinics (UI Health's FQHC clinics)

Successful Learning by Primary Care Providers: Pre- and Post- Educational Interventions



DEPARTMENT OF MEDICINE
COLLEGE OF MEDICINE

Assessing and Addressing Knowledge Gaps Among Internal Medicine to Improve Lung Cancer Screening Rates

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[a]Department of Academic Internal Medicine and Geriatrics; [b]Department of Pulmonology; [c]Department of Oncology

UI Health CANCER CENTER

Introduction

- In 2011, the National Lung Screening Trial (NLST) was published, showing for the first time that screening for lung cancer was effective at reducing overall mortality in selected patients.[1]
- Improving the number of patients appropriately referred for screening should lead to detection of earlier lung cancer and help decrease mortality.
- We sought to obtain a baseline acumen of providers' knowledge about LCS and develop interventions to educate providers and facilitate more effective use of LCS for high-risk patients.

Methods

- A multiple-choice survey was distributed to Internal Medicine residents in General Medicine clinic at UIC in July 2016 to assess baseline knowledge of USPSTF lung cancer screening guidelines.

- The total number of appropriately ordered lung cancer screening tests was tracked in 2016-2017
- After a number of interventions, post-intervention survey was given to assess for improvement in knowledge.

Interventions

- September 2016 - Pre-intervention survey results reviewed with residents. Informational flyers placed in clinic.
- December 2016 - reminder email which included USPSTF criteria and shared decision making template sent to residents.
- In March 2017- the 'CT low dose lung cancer screening' order was updated to include the USPSTF criteria (below)

USPSTF criteria directed order

Survey results

- Of 147 Internal Medicine or combined residents, 53 completed a pre-intervention survey and 26 completed a post-intervention survey. The percentage of correct responses by pre and post-intervention are shown above.

Increases in Screening

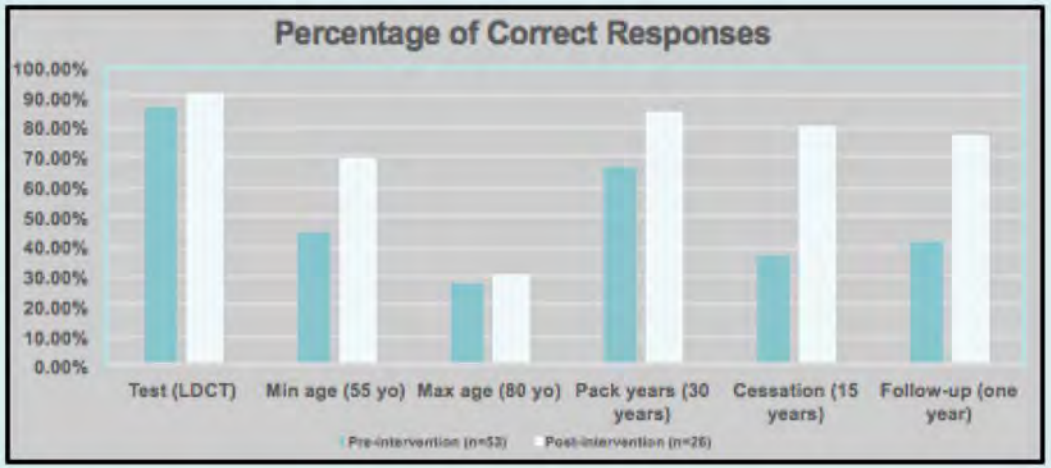
- After discussing the survey results and educating Internal Medicine residents, the average number of screens ordered through GMC clinic increased from 6.8 per month [May 2016 to September 2016] to 10.6 per month [October 2016 to April 2017]
- LDCT orders from other primary care clinics at UIC stayed stable throughout this timeframe.

Discussion

- Gaps in knowledge regarding USPSTF lung cancer screening guidelines remain among internal medicine residents.
- Our data suggests that using educational interventions and changes in EMR to increase awareness and knowledge may help increase usage of LDCTs for LCS.
- Limitations of our study include low sample size, limited follow up and limited representation of entire class. It is also unclear which intervention led to an increase in screening (surveys vs. reminder email vs. change in EMR order)
- Although the criteria directed ordering was implemented throughout UIC, we believe our educational interventions had a larger impact because it was the only clinic that saw an increase in LCS ordered. We plan to broaden our interventions to other primary care clinics at UIC.

References

Successful Learning by Primary Care Providers: Pre- and Post- Educational Interventions



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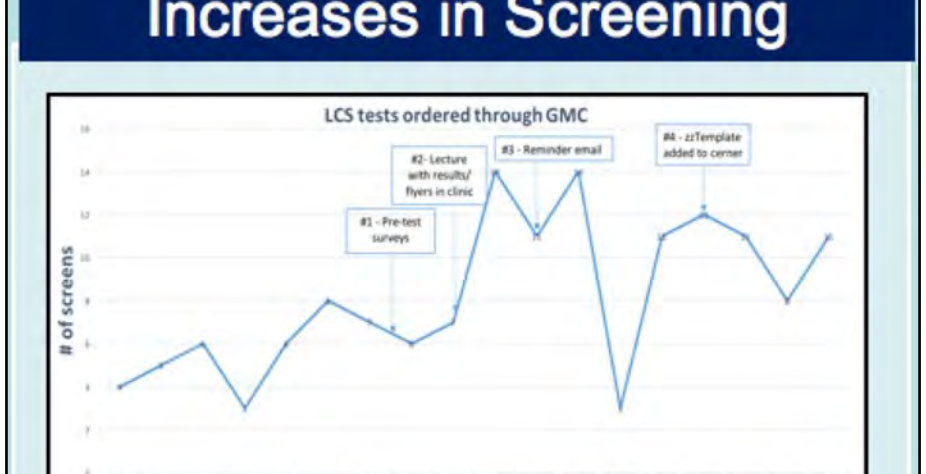

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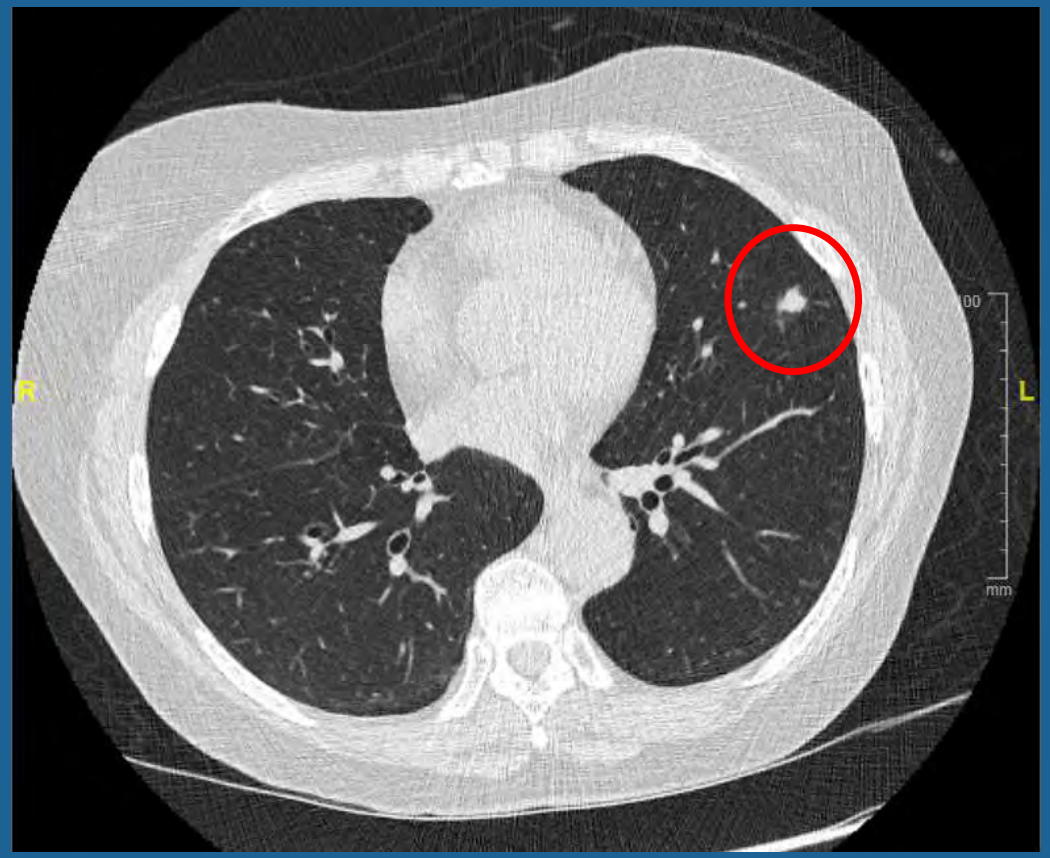
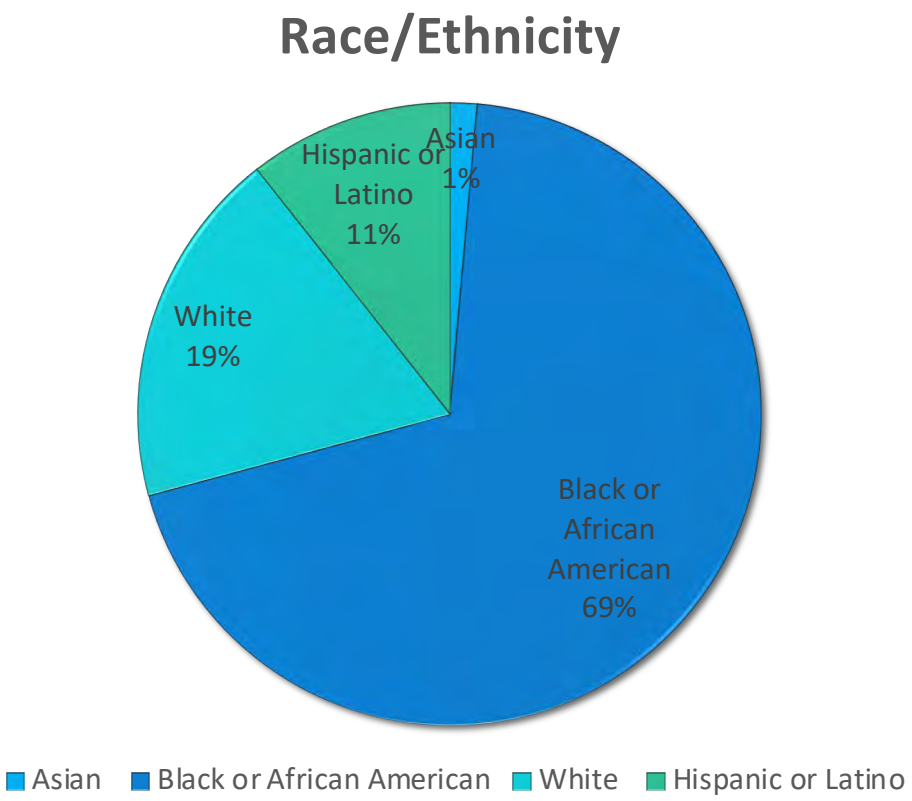
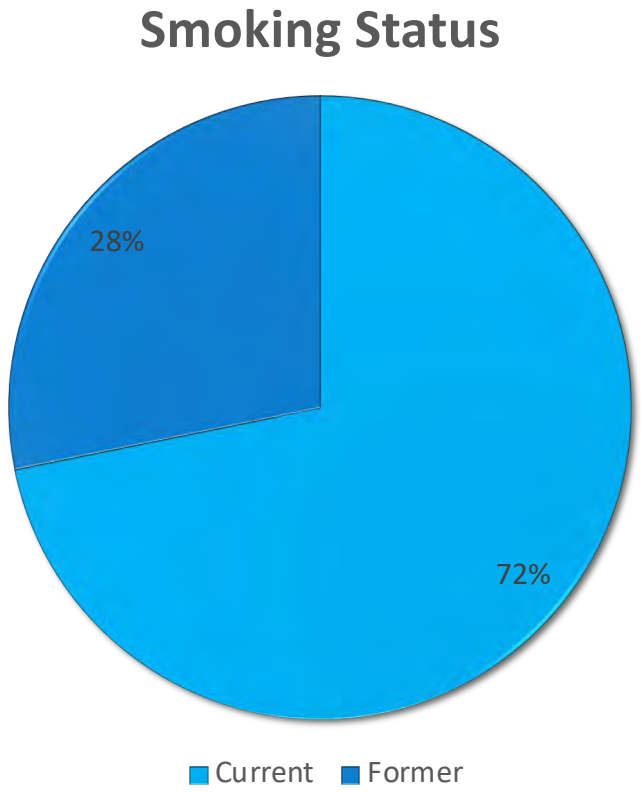
Results of UIC Lung Cancer Screening Program

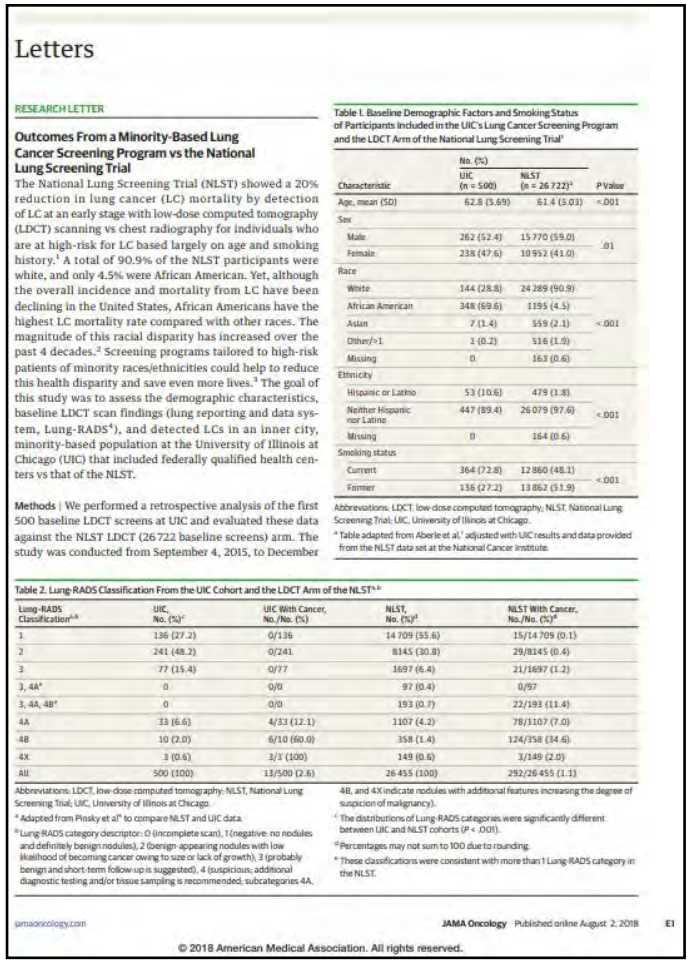


UIC's LDCT Screening Cohort





Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial



Letters

RESEARCH LETTER

Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial

The National Lung Screening Trial (NLST) showed a 20% reduction in lung cancer (LC) mortality by detection of LC at an early stage with low-dose computed tomography (LDCT) scanning vs chest radiography for individuals who are at high-risk for LC based largely on age and smoking history.[1] A total of 90.9% of the NLST participants were white, and only 4.5% were African American. Yet, although the overall incidence and mortality from LC have been declining in the United States, African Americans have the highest LC mortality rate compared with other races. The magnitude of this racial disparity has increased over the past 4 decades.[2] Screening programs tailored to high-risk patients of minority races/ethnicities could help to reduce this health disparity and save even more lives.[3] The goal of this study was to assess the demographic characteristics, baseline LDCT scan findings (lung reporting and data system, Lung-RADS[4]), and detected LCs in an inner city, minority-based population at the University of Illinois at Chicago (UIC) that included federally qualified health centers vs that of the NLST.

Methods | We performed a retrospective analysis of the first 500 baseline LDCT screens at UIC and evaluated these data against the NLST LDCT (26 722 baseline screens) arm. The study was conducted from September 4, 2015, to December

Table 1. Baseline Demographic Factors and Smoking Status of Participants Included in the UIC's Lung Cancer Screening Program and the LDCT Arm of the National Lung Screening Trial[a]

Characteristic	No. (%) UIC (n = 500)	NLST (n = 26 722)[a]	P Value
Age, mean (SD)	62.8 (5.69)	61.4 (5.03)	<.001
Sex			
Male	262 (52.4)	15 770 (59.0)	.01
Female	238 (47.6)	10 952 (41.0)	
Race			
White	144 (28.8)	24 289 (90.9)	<.001
African American	348 (69.6)	1195 (4.5)	
Asian	7 (1.4)	559 (2.1)	
Other/>1	1 (0.2)	516 (1.9)	
Missing	0	163 (0.6)	
Ethnicity			
Hispanic or Latino	53 (10.6)	479 (1.8)	<.001
Neither Hispanic nor Latino	447 (89.4)	26 079 (97.6)	
Missing	0	164 (0.6)	
Smoking status			
Current	364 (72.8)	12 860 (48.1)	<.001
Former	136 (27.2)	13 862 (51.9)	

Abbreviations: LDCT, low-dose computed tomography; NLST, National Lung Screening Trial; UIC, University of Illinois at Chicago.

[a] Table adapted from Aberle et al,[1] adjusted with UIC results and data provided from the NLST data set at the National Cancer Institute.

Table 2. Lung-RADS Classification From the UIC Cohort and the LDCT Arm of the NLST[a,b]

Lung-RADS Classification[a,c]	UIC, No. (%)[c]	UIC With Cancer, No./No. (%)	NLST, No. (%)[d]	NLST With Cancer, No./No. (%)[d]
1	136 (27.2)	0/136	14 709 (55.6)	15/14 709 (0.1)
2	241 (48.2)	0/241	8145 (30.8)	29/8145 (0.4)
3	77 (15.4)	0/77	1697 (6.4)	21/1697 (1.2)
3, 4A[e]	0	0/0	97 (0.4)	0/97
3, 4A, 4B[e]	0	0/0	193 (0.7)	22/193 (11.4)
4A	33 (6.6)	4/33 (12.1)	1107 (4.2)	78/1107 (7.0)
4B	10 (2.0)	6/10 (60.0)	358 (1.4)	124/358 (34.6)
4X	3 (0.6)	3/3 (100)	149 (0.6)	3/149 (2.0)
All	500 (100)	13/500 (2.6)	26 455 (100)	292/26 455 (1.1)

Abbreviations: LDCT, low-dose computed tomography; NLST, National Lung Screening Trial; UIC, University of Illinois at Chicago.

[a] Adapted from Pinsky et al[5] to compare NLST and UIC data.

[b] Lung-RADS category descriptor: 0 (incomplete scan), 1 (negative: no nodules and definitely benign nodules), 2 (benign-appearing nodules with low likelihood of becoming cancer owing to size or lack of growth), 3 (probably benign and short-term follow-up is suggested), 4 (suspicious; additional diagnostic testing and/or tissue sampling is recommended; subcategories 4A, 4B, and 4X indicate nodules with additional features increasing the degree of suspicion of malignancy).

[c] The distributions of Lung-RADS categories were significantly different between UIC and NLST cohorts ($P < .001$).

[d] Percentages may not sum to 100 due to rounding.

[e] These classifications were consistent with more than 1 Lung-RADS category in the NLST.

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Letters

28, 2017. Inclusion criteria for the UIC cohort were the same as in the NLST study.[1] We compared UIC LDCT findings with those of the NLST using Lung-RADS criteria that were established by the American College of Radiology in 2015 and retrospectively applied to the NLST in a secondary analysis (26 455 evaluable).[4] Lung-RADS is now in common use as a system for risk stratifying and standardizing LDCT findings on a scale of 0 to 4 primarily based on the presence and/or characteristics of lung nodules. Demographic data, Lung-RADS scores of baseline LDCT scans, and diagnosed LC cases were collected and evaluated vs data of the NLST LDCT arm. Summary statistics and statistical tests (2-tailed, unpaired *t* tests for continuous variables and χ^2 tests for categorical variables) were applied to compare the UIC cohort with the NLST LDCT arm. The study was approved by the UIC Institutional Review Board. Statistical analysis was performed using SAS, version 9.4 (SAS Institute Inc).

Results | Demographic characteristics of the UIC cohort did not resemble those of the NLST LDCT arm (**Table 1**). The UIC cohort had a different racial and ethnic composition than the NLST LDCT arm ($P < .001$) of African American (UIC, 69.6% [348 of 500] vs NLST, 4.5% [1195 of 26 722]) and Hispanic or Latino (UIC, 10.6% [53 of 500] vs NLST, 1.8% [479 of 26 722]) individuals. The UIC cohort had a higher percentage of current smokers than the NLST LDCT arm (72.8% [364 of 500] vs 48.1% [12 860 of 26 722], respectively). The outcome distribution of Lung-RADS categories in the UIC sample was different from that in the NLST LDCT arm sample ($P < .001$). Proportion of positive (Lung-RADS class 3 or 4) LDCT screens in the UIC cohort (24.6% [123 of 500]) was nearly double that in the NLST LDCT arm (13.7% [3601 of 26 455]) (**Table 2**). The UIC cohort had a higher LC detection rate (2.6% [13 of 500]) than the NLST LDCT (1.1% [292 of 26 455]) arm ($P = .002$). Consistent with the goal of screening, both cohorts had greater than 50% of LC cases detected at an early (stage I) curable stage (UIC [7 of 13] and NLST [155 of 266]).

Discussion | The UIC cohort had a higher percentage of African American individuals, positive LDCT scans, and percentage of diagnosed LC cases. These real-world differences are in accordance with a secondary analysis from NLST that showed that reduction in LC mortality was greatest among African American participants.[5] This report provides experiential evidence that is consistent with the notion that a more-detailed assessment of individual risk of LC may be more effective than focusing only on age and smoking status criteria.[6] The magnitude of the disparity in LC mortality between African American and white individuals has been widening.[2] Screening that is skewed toward the white population could paradoxically increase racial disparities in LC outcomes.[3] Refining risk-based guidelines would improve the beneficial results of LDCT screening.[6]

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Concept and design: Pasquinelli, Kovitz, Koshy, Winn, Feldman.
Acquisition, analysis, or interpretation of data: Pasquinelli, Kovitz, Menchaca, Liu, Feldman.
Drafting of the manuscript: Pasquinelli, Koshy, Liu, Winn, Feldman.
Critical revision of the manuscript for important intellectual content: Pasquinelli, Kovitz, Koshy, Menchaca, Winn, Feldman.
Statistical analysis: Pasquinelli, Koshy, Liu, Feldman.
Administrative, technical, or material support: Pasquinelli, Menchaca, Feldman.
Supervision: Pasquinelli, Kovitz, Koshy, Winn, Feldman.

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Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial

Table 1. Baseline Demographic Factors and Smoking Status of Participants Included in the UIC's Lung Cancer Screening Program and the LDCT Arm of the National Lung Screening Trial[1]

Characteristic	No. (%) UIC (n = 500)	No. (%) NLST (n = 26 722)[a]	P Value
Age, mean (SD)	62.8 (5.69)	61.4 (5.03)	<.001
Sex			
Male	262 (52.4)	15 770 (59.0)	.01
Female	238 (47.6)	10 952 (41.0)	
Race			
White	144 (28.8)	24 289 (90.9)	<.001
African American	348 (69.6)	1195 (4.5)	
Asian	7 (1.4)	559 (2.1)	
Other/>1	1 (0.2)	516 (1.9)	
Missing	0	163 (0.6)	
Ethnicity			
Hispanic or Latino	53 (10.6)	479 (1.8)	<.001
Neither Hispanic nor Latino	447 (89.4)	26 079 (97.6)	
Missing	0	164 (0.6)	
Smoking status			
Current	364 (72.8)	12 860 (48.1)	<.001
Former	136 (27.2)	13 862 (51.9)	

Abbreviations: LDCT, low-dose computed tomography; NLST, National Lung Screening Trial; UIC, University of Illinois at Chicago.

[a] Table adapted from Aberle et al,[1] adjusted with UIC results and data provided from the NLST data set at the National Cancer Institute.

PASQUINELLI M, KOVITZ K, KOSHY M, MENCHACA M, LIU L, WINN R, FELDMAN L. OUTCOMES FROM A MINORITY-BASED LUNG CANCER SCREENING PROGRAM VS THE NATIONAL LUNG SCREENING TRIAL. JAMA ONCOL. 2018;4(9):1291-1293.

Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial

Table 2. Lung-RADS Classification From the UIC Cohort and the LDCT Arm of the NLST[a,b]

Lung-RADS Classification[a,b]	UIC, No. (%)[c]	UIC With Cancer, No./No. (%)	NLST, No. (%)[d]	NLST With Cancer, No./No. (%)[d]
1	136 (27.2)	0/136	14 709 (55.6)	15/14 709 (0.1)
2	241 (48.2)	0/241	8145 (30.8)	29/8145 (0.4)
3	77 (15.4)	0/77	1697 (6.4)	21/1697 (1.2)
3, 4A[e]	0	0/0	97 (0.4)	0/97
3, 4A, 4B[e]	0	0/0	193 (0.7)	22/193 (11.4)
4A	33 (6.6)	4/33 (12.1)	1107 (4.2)	78/1107 (7.0)
4B	10 (2.0)	6/10 (60.0)	358 (1.4)	124/358 (34.6)
4X	3 (0.6)	3/3 (100)	149 (0.6)	3/149 (2.0)
All	500 (100)	13/500 (2.6)	26 455 (100)	292/26 455 (1.1)

Abbreviations: LDCT, low-dose computed tomography; NLST, National Lung Screening Trial; UIC, University of Illinois at Chicago.

[a] Adapted from Pinsky et al[4] to compare NLST and UIC data.

[b] Lung-RADS category descriptor: 0 (incomplete scan), 1 (negative: no nodules and definitely benign nodules), 2 (benign-appearing nodules with low likelihood of becoming cancer owing to size or lack of growth), 3 (probably benign and short-term follow-up is suggested), 4 (suspicious; additional diagnostic testing and/or tissue sampling is recommended; subcategories 4A, 4B, and 4X indicate nodules with additional features increasing the degree of suspicion of malignancy).

[c] The distributions of Lung-RADS categories were significantly different between UIC and NLST cohorts ($P < .001$).

[d] Percentages may not sum to 100 due to rounding.

[e] These classifications were consistent with more than 1 Lung-RADS category in the NLST.

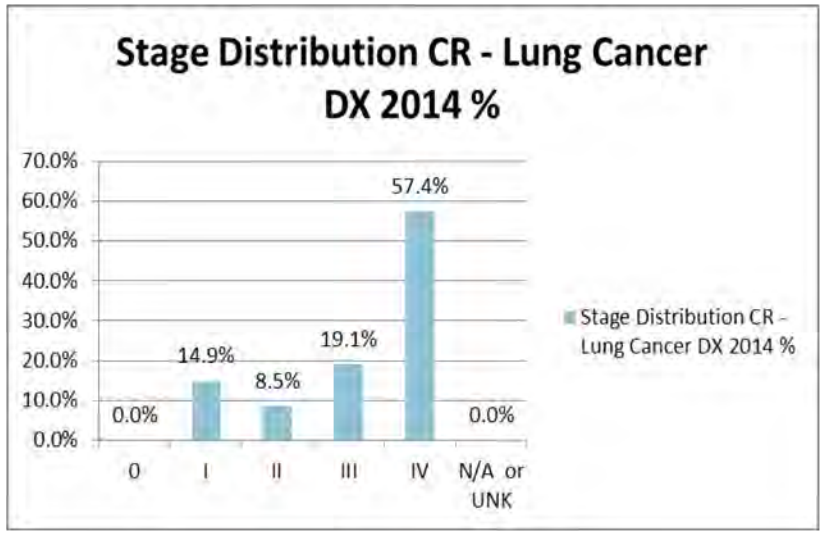
PASQUINELLI M, KOVITZ K, KOSHY M, MENCHACA M, LIU L, WINN R, FELDMAN L. OUTCOMES FROM A MINORITY-BASED LUNG CANCER SCREENING PROGRAM VS THE NATIONAL LUNG SCREENING TRIAL. JAMA ONCOL. 2018;4(9):1291-1293.

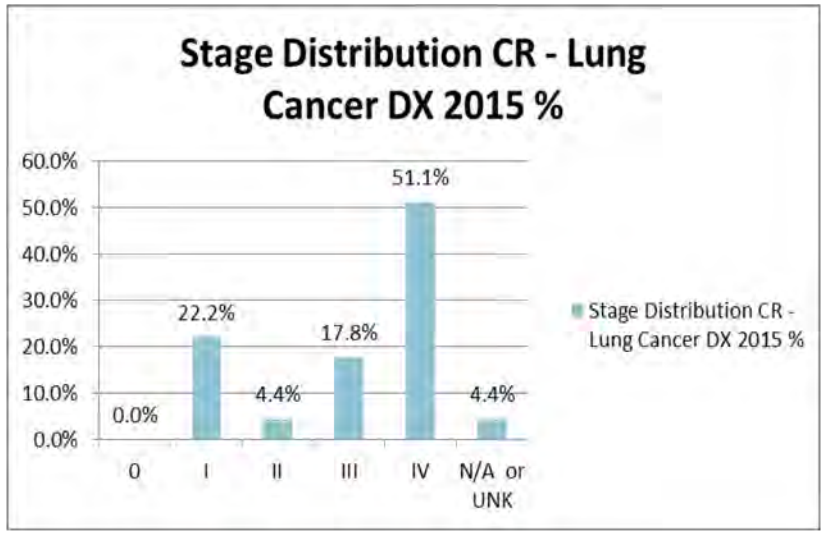
Outcomes From a Minority-Based Lung Cancer Screening Program vs the National Lung Screening Trial

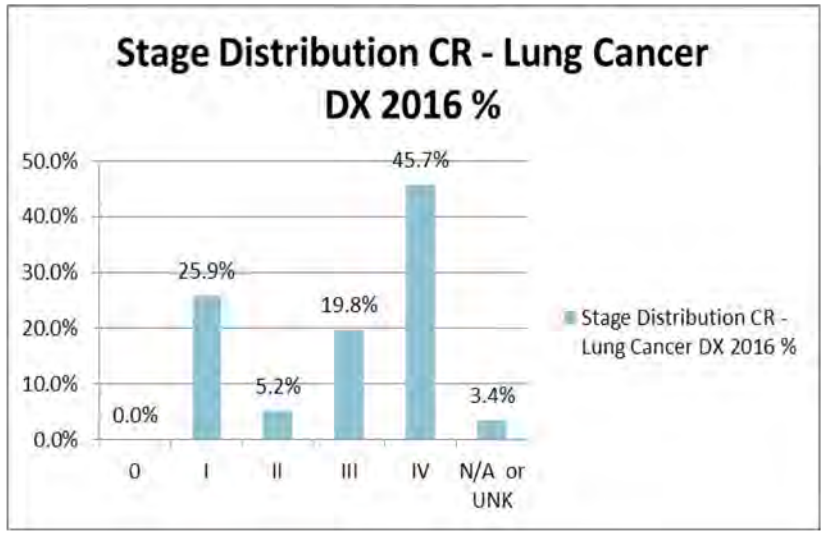
Discussion Points:

- Consistent with the goal of screening, both cohorts had greater than 50% of lung cancer cases detected at an early (stage I) curable stage (UIC [7 of 13] and NLST [155 of 266]).
- The magnitude of the disparity in lung cancer mortality between African American and white individuals has been widening.
- Screening that is skewed toward the white population could paradoxically increase racial disparities in lung cancer outcomes.
- These real-world differences are in accordance with a secondary analysis from NLST that showed that reduction in lung cancer mortality was greatest among African American participants.
- Refining risk-based guidelines would improve the beneficial results of LDCT screening.

Meeting the Goal of Early Detection: Results of UIC's Lung Cancer Screening Program (N = 500)







Downstream Revenue

Downstream Revenue Attributable to Lung Cancer Screening Program Serving a Minority Predominant Population

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Background

The National Lung Screening Trials (NLST) showed a 20% decrease in mortality from lung cancer in the patients screened with low-dose CT when compared to chest radiography. The NLST also demonstrated a 6.7% reduction in mortality from any cause in the LDCT group. (due to incidental findings such as aneurysms, cardiac disease, etc.) As a result of this study, the US Preventative Service Task force (grade B) recommends annual lung cancer screenings with LDCT for patients who meet the following criteria:

Age 55-80
30 pack year smoking history
Current smoker or has quit within the past 15 years

The goal of incorporating such screening programs into health systems is to identify cases of lung cancer in early stages of development and thereby reduce mortality. University of Illinois Health System (UIH) implemented a lung cancer screening program following these criteria and this study will evaluate patients screened from 2015-2017.

This study will seek to provide an estimate of the downstream revenue of the Lung Cancer Screening Program within UIH. Downstream revenue is defined as revenue captured after a patient uses one hospital service and then subsequently uses others. It is used to evaluate the economic impact of a new procedure or program within a hospital system. Downstream revenue from this program would capture the revenue from screening as well as any required follow-up – this could include additional LDCTs, chemotherapy, surgical procedures, radiation, etc.

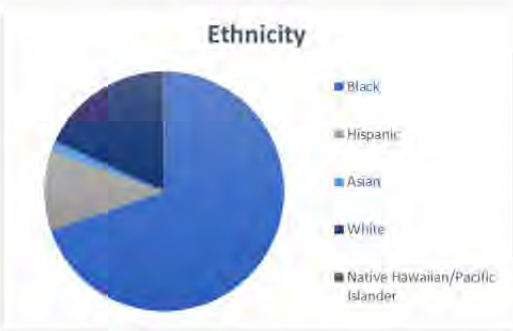
This study is unique in assessing the financial value of a screening program that serves a specific population. Thirty-eight percent of patients within the program receive insurance through Medicaid/Medicaid Managed Care and 46% have Medicare as their insurance provider. Approximately 70% patients screened are black/African American.

Methods

In performing this analysis, we will first identify all patients included in the screening program. All patients receive an initial LDCT to screen for the presence of nodules. Results of the LDCT can be classified according to Lung Imaging Reporting and Data System (Lung-RADS). Results are placed in categories: 1, 2, 3, 4a, 4b, and 4x, representing findings that are increasingly suspicious for lung cancer. Based on the category, different follow up protocols are encouraged.

Compass® was queried using the MRN list & screening dates provided by Mary Pasquinelli, APN Lung Screening Program Director, for the LDCT program between FY15 and FY17. Downstream patient activity was queried in Compass® by MRN and by each individual screening date through September 2017. All downstream cases were then filtered using the diagnosis code field to include only those cases related to LDCT. Using the filtered downstream cases, Trendstar® was queried to gather cost and operating margin data.

Percentage of Lung Cancer Diagnosed at an Early Stages (SEER statistics) = 16%
Percentage of Lung Cancer Diagnosed at an Early Stages within Screening Program = 50%



Results

- The downstream revenue for screened patients in the LDCT program resulted in a net revenue of approximately $515K. This is approximately $770/case in net revenue.
- There were a total of 21 inpatient screening cases in this time span which accounted for a downstream revenue of approximately $270K. The Medicare Managed Care payor represented 34% of the payor mix. The Medicare payor represented 19% of the payor mix.
- There were a total of 647 outpatient cases which resulted in an operating margin of $244K.
- Of the patients screened, 13 patients were diagnosed with cancer. All subsequent diagnostic work and treatment after the initial screening of these patients was totaled and the net revenue was $157K. This equates to approximately $5,900/patient in downstream revenue of this subset of patients.

Discussion

The downstream revenue attributable to the lung cancer screening program at UIH is approximately $770/case. The overall net revenue for the screening program is approximately $515K from 2015-2017.

The screening program has detected 16 cancer cases, 8 of which were early stage cancers. In consideration of the mortality benefit of this program and the higher risk population it serves, Further research could evaluate the financial value of ta positive downstream revenue of $770/case demonstrates that a lung cancer screening program is viable in a low socioeconomic environment. his screening program as it continues to expand. It is notable that the LDCT used for screening may incidentally detect additional health problems, and this could provide additional downstream revenue attributable to this screening. Further research could evaluate the financial value of this screening program as it continues to expand in coming years.

It is notable that the LDCT used for screening may incidentally detect additional health problems and this could provide additional downstream revenue attributable to lung cancer screening. This could be an area of further investigation.

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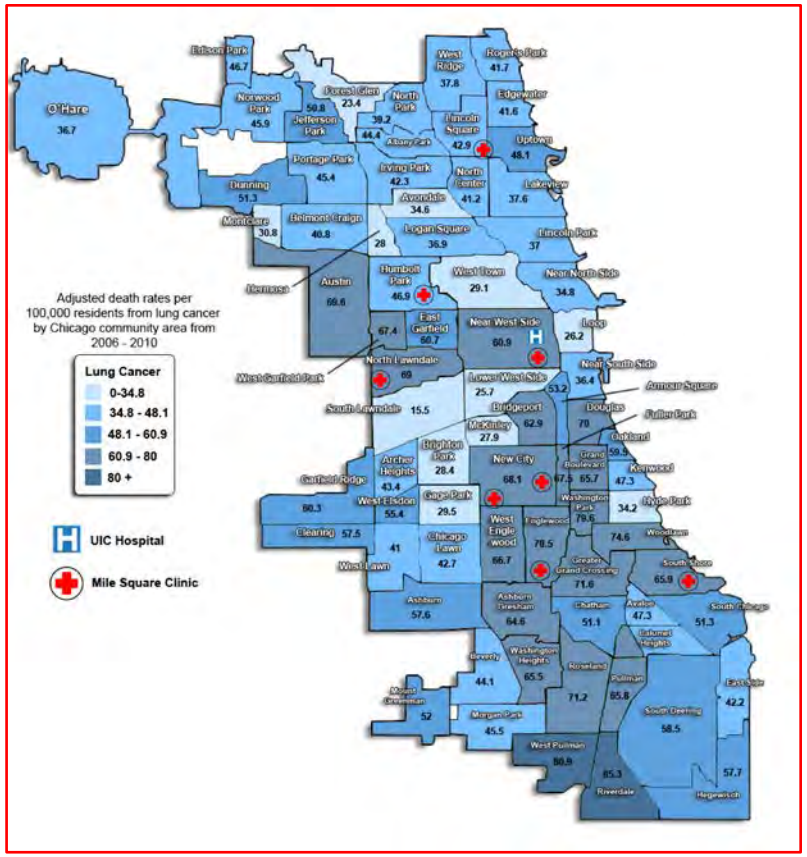
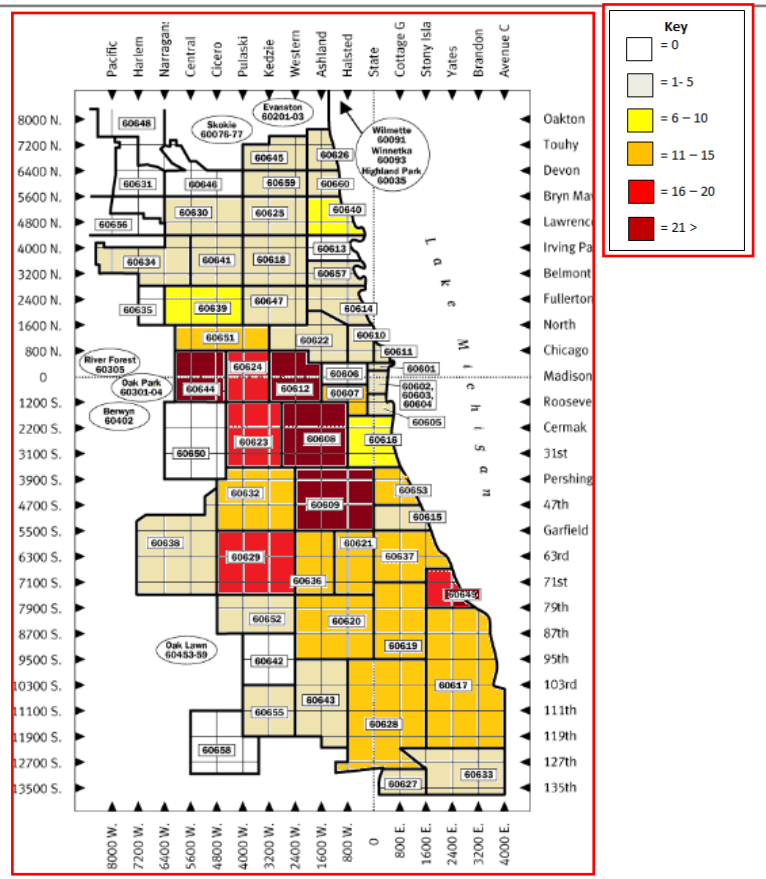
Targeted Lung Cancer Screening- Current and Future Phases

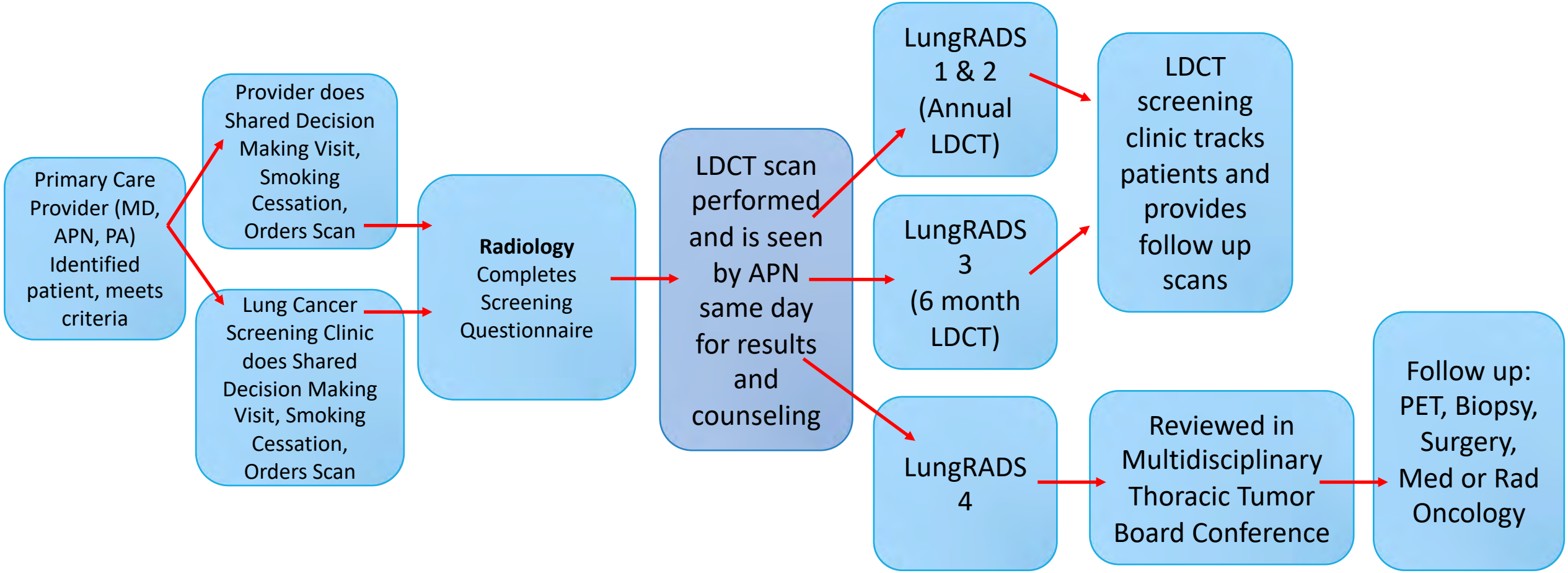


Lung Cancer Mortality Rate in Chicago



Lung Cancer Screening Rate at UIC

2019: APN Led Lung Screening Clinic



2019: APN Led Lung Screening Clinic

- Consistent messaging to patients
- Patients see their screen – nodules, emphysema, coronary calcification: teachable moment
- In depth smoking cessation counseling, provide follow up and resources
- Screen for head and neck cancers– same high-risk population
- Assist with overcoming barriers to care and follow up - lung navigator
- Streamlines patient tracking and follow-up LDCT process
- Partnership with lung cancer researchers – obtain bio-samples for biomarker research

Goal of program: Save lives from tobacco related diseases and reduce health disparities

Conclusions and Future Directions

- Lung cancer screening with low-dose CT scan can be successfully accomplished in minority and underserved communities.
- High risk communities may benefit most by lung screening and help to decrease health disparities.
- New model of APN led lung screening clinic can improve outcomes
- We are examining our patients diagnosed with lung cancer to determine best available models for establishing screening eligibility criteria.
- Eligibility criteria for screening may need to be tailored to specific communities that are being screened.

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