IMPROVING LUNG CANCER SCREENING AT A SAFETY-NET HOSPITAL:
EMPOWERING AT-RISK PATIENTS THROUGH SELF-IDENTIFICATION

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History of Lung Cancer Screening (LCS)

LCS has origins as early as the 1960s, when chest X-ray and sputum cytologic testing were used for lung cancer screening.

In 2010, the National Lung Screening Trial (NLST) data became available, which revealed a significant reduction in the rates of death from lung cancer with low-dose CT screening when compared to chest radiograph.

In 2013, the U.S. Preventive Services Task Force (USPSTF) recommended annual lung cancer screening for adults ages 55 to 80 who currently smoke or have quit within the past 15 years and have a 30 pack-year smoking history.

In 2015, the Affordable Care Act (ACA) required full cost insurance coverage of lung cancer screening without cost-sharing for patients who meet the USPSTF criteria.

In 2021, USPSTF updated its recommendations for lung cancer screening. The recommended age range for screening was expanded from 50 to 80 years, the minimum pack-year smoking history was reduced to 20 pack-years, and it included people who currently smoke or have quit within the past 15 years.

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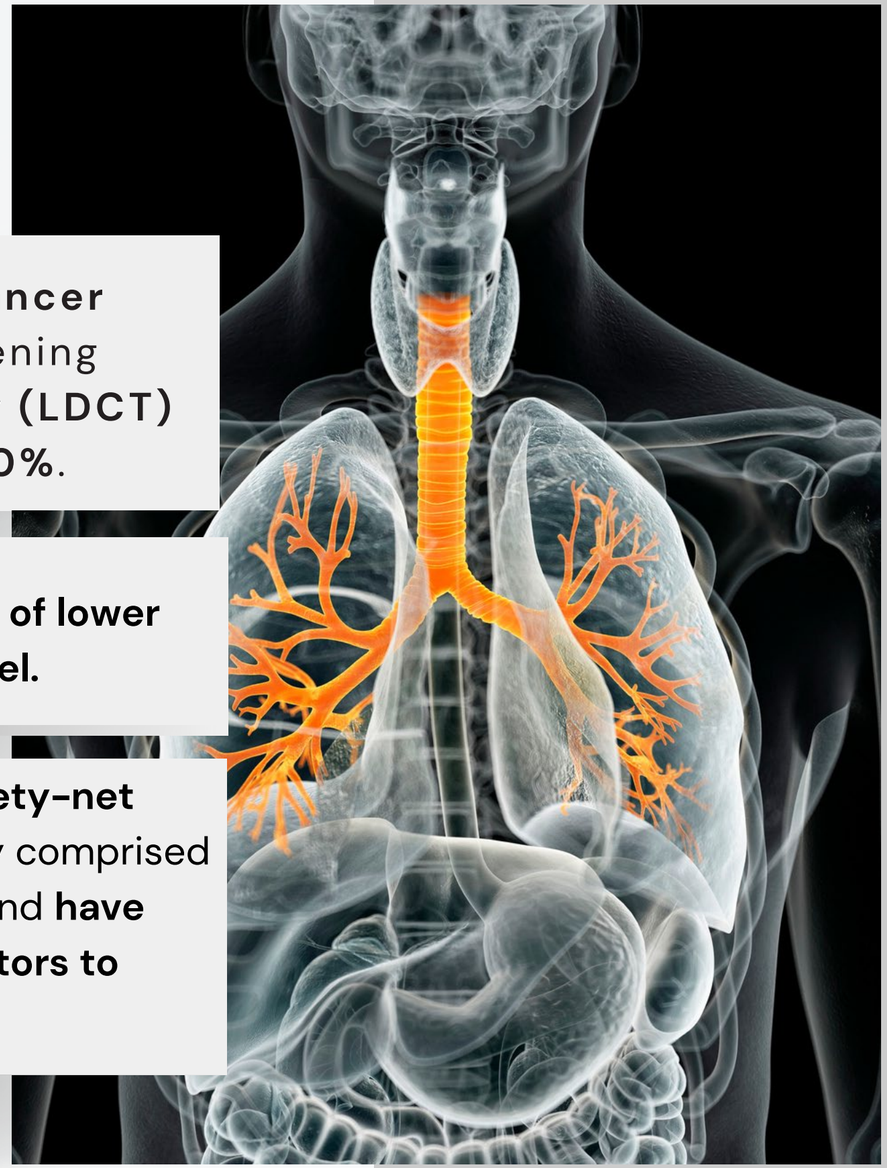
BACKGROUND

Lung cancer (LC) is the leading cause of cancer death in the US. However, Lung Cancer Screening (LCS) with **low-dose computed tomography (LDCT) can reduce mortality from LC by at least 20%**.

LC disproportionally affects persons that are Black, of lower socioeconomic status, and of lower educational level.

We at Boston Medical Center (BMC) is the largest **safety-net hospital in New England**, and our population is largely comprised of patients who are **Black**, of **lower education level**, and **have COPD or emphysema**, all of which are known **risk factors to developing lung cancer**.



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BARRRIERS TO SCREENING

BMC implemented a comprehensive LCS program in March 2015. However, **both national studies and institutional studies indicate very low uptake of screening.** We also found that among patients who seek medical care at BMC in our primary care setting, **clear documentation of pack-year is lacking in ~30%**.

HEALTHCARE SYSTEM LEVEL

- **Logistical barriers** for systemic implementation and smooth integration into internal workflow systems.
- **Limited number and distribution of screening centers** nationwide.
- **Competing priorities** and allocation of resources to other interventions and programs.

HEALTHCARE PROVDER LEVEL

- Provider's **lack of knowledge about LCS guidelines** and follow-up.
- **Time constraints** and inadequate patient-provider discussions.
- **Deficiencies in the electronic medical record (EMR)**.

INDIVIDUAL PATIENT LEVEL

- **Lack of awareness** about causative link between smoking and lung cancer.
- **Knowledge avoidance** and nihilism.
- **Fear and stigma** .
- **Financial concerns** .
- **Language barriers** .
- **Lack of access** .

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Objective

Improve rate of LCS by better **empowering patients engaged in radiology care to self-identify as eligible**.

Hypothesis

We hypothesized that **outreach to patients already engaged in radiologic testing would improve screening rates**.

Methods

Over an 18-month period between 2021 to 2024, we offered a **voluntary smoking history questionnaire** assessing demographics, lung cancer risk factors, LCS eligibility, and relevant medical and family history **to all patients arriving for imaging appointments**.

For patients who self-identified as **LCS-eligible and were not currently undergoing LCS, we notified the patient's primary care provider** to share the findings and emphasize the importance of LCS. We then followed-up via chart review to determine whether a LDCT was ordered.

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6,160 questionnaires were collected

4,975 participants were excluded.
4,004 were nonsmokers.
369 provided incomplete forms.
602 declined to participate.

1,185 smokers were identified.

812 smokers were excluded as they did not meet the 2013 or the 2021 USPSTF LCS criteria were identified.

373 (6.0%) smokers who met the 2013 or the 2021 USPSTF LCS criteria were identified.

103 (27.6%) met the 2013 USPSTF LCS criteria

58 (56.3%) were <u>not</u> undergoing LCS screening.

270 (72.4%) met the *only* 2021 USPSTF LCS criteria

114 (53.3%) were <u>not</u> undergoing LCS screening.

All providers were notified, 20 patients subsequently underwent LDCT LCS.

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QUESTIONNAIRE RESULTS

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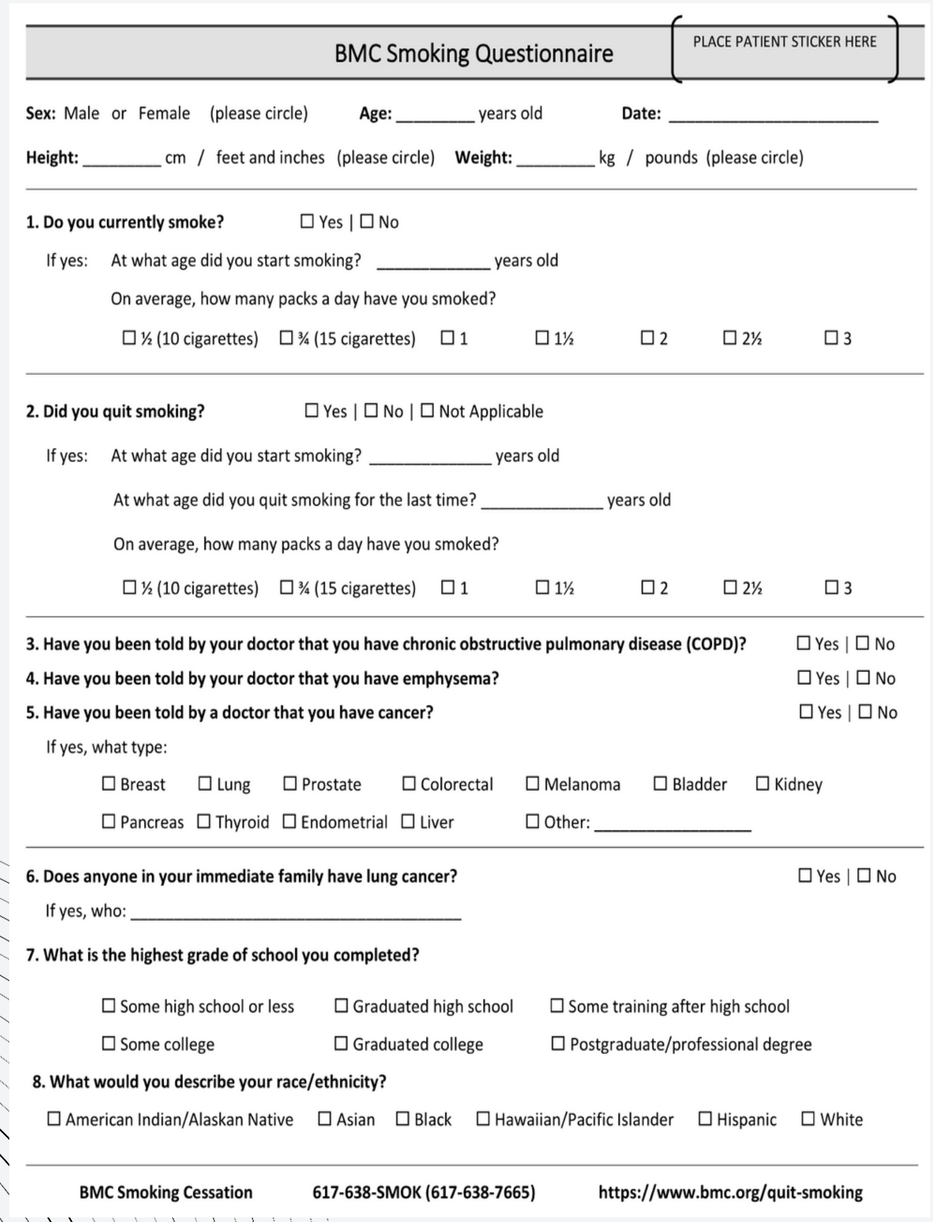

BMC Smoking Questionnaire

PLACE PATIENT STICKER HERE

Sex: Male or Female (please circle) **Age:** _____ years old **Date:** _____

Height: _____ cm / feet and inches (please circle) **Weight:** _____ kg / pounds (please circle)

1. Do you currently smoke? ☐ Yes | ☐ No

If yes: At what age did you start smoking? _____ years old

On average, how many packs a day have you smoked?

☐ ½ (10 cigarettes) ☐ ¾ (15 cigarettes) ☐ 1 ☐ 1½ ☐ 2 ☐ 2½ ☐ 3

2. Did you quit smoking? ☐ Yes | ☐ No | ☐ Not Applicable

If yes: At what age did you start smoking? _____ years old

At what age did you quit smoking for the last time? _____ years old

On average, how many packs a day have you smoked?

☐ ½ (10 cigarettes) ☐ ¾ (15 cigarettes) ☐ 1 ☐ 1½ ☐ 2 ☐ 2½ ☐ 3

3. Have you been told by your doctor that you have chronic obstructive pulmonary disease (COPD)? ☐ Yes | ☐ No

4. Have you been told by your doctor that you have emphysema? ☐ Yes | ☐ No

5. Have you been told by a doctor that you have cancer? ☐ Yes | ☐ No

If yes, what type:

☐ Breast ☐ Lung ☐ Prostate ☐ Colorectal ☐ Melanoma ☐ Bladder ☐ Kidney

☐ Pancreas ☐ Thyroid ☐ Endometrial ☐ Liver ☐ Other: _____

6. Does anyone in your immediate family have lung cancer? ☐ Yes | ☐ No

If yes, who: _____

7. What is the highest grade of school you completed?

☐ Some high school or less ☐ Graduated high school ☐ Some training after high school

☐ Some college ☐ Graduated college ☐ Postgraduate/professional degree

8. What would you describe your race/ethnicity?

☐ American Indian/Alaskan Native ☐ Asian ☐ Black ☐ Hawaiian/Pacific Islander ☐ Hispanic ☐ White

BMC Smoking Cessation **617-638-SMOK (617-638-7665)** **https://www.bmc.org/quit-smoking**

Total LCS-eligible participants	**373**
Mean age (years)	62
Gender	
Female	246 (66.0%)
Male	127 (34.0%)
Smoking History	
Age start smoking (median)	16
Average PPD	0.91
Average pack-years	38.8
COPD	100 (26.8%)
Emphysema	45 (12.1%)
Family history of lung cancer	50(13.4%)

Race/Ethnicity	
American Indian/ Alaskan Native	12 (3.2%)
Asian	9 (2.4%)
Black	142 (38.2%)
Hawaiian/ Pacific Islander	0 (0.0%)
Hispanic	48 (12.9%)
White	161 (43.3%
Level of Education	
Some high school or less	63 (17.2%)
Graduated high school	106 (29.0%)
Some training after high school	34 (9.3%)
Some college	88 (24.0%)
Graduated college	43 (11.7%)
Postgraduate/ professional degree	17 (4.6%)
Unknown	15 (4.1%)

DISCUSSION

- Despite identifying 373 patients as LCS-eligible, **more than half of those meeting both the 2013 USPSTF criteria and the 2021 criteria were not currently undergoing screening**, which suggests that **there are barriers to care not related to gaps in knowledge about the updated guidelines that we are not addressing**.

- A substantial proportion of our cohort had a lower level of education, with nearly **46% having a high school diploma or less**. This underscores the **need for enhanced educational outreach to improve patient understanding of LCS benefits**.

- Interestingly, most of our cohort did not have a family history of lung cancer (86.6%) or chronic lung conditions such as COPD or emphysema (73.2%), which may have influenced their perceived risk.

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CHALLENGES & SOLUTIONS

Integrating **LCS eligibility assessments into the online appointment scheduling process**

Automation would allow for continuous, consistent screening without relying on in-person interventions.

Automated smoking history questionnaires would **flag patients as eligible** for LCS based on current USPSTF guidelines.

This would allow for a **shared-decision making visit to be scheduled more easily.**

For patients with limited access to online systems, alternative outreach approaches can be employed.

Initiatives such as **telephone-based questionnaires or in-clinic kiosks may be necessary to ensure equitable access.**

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