



# EP04.13: Multimodal Lung Cancer Risk Stratification for Non-Smoking Women

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## INTRODUCTION

- Lung cancer is rising in never-smoking women (66% of the 20,000-40,000 never-smokers diagnosed annually in the US are women). Current screening guidelines exclude people who have never smoked -> critical gap in early detection. Existing lung cancer risk models (e.g. PLCO<sub>2014</sub>) perform poorly in people who have never smoked but novel tools like Sybil (deep learning imaging analysis) show promise in this population. Additional known risk factors: Asian race, family history of cancer, chronic PM2.5 exposure, secondhand smoke, prior cancer, chronic pulmonary disease, radon, germline mutations (e.g., BRMS1)
- Objective: Create a multimodal risk model combining clinical, genomic, environmental, and imaging data to predict lung cancer risk for never-smoking women

## OBJECTIVES

### Primary Objective:

- Identify factors associated with lung cancer risk in never-smoking women using clinical, demographic, exposure, and genomic data

### Secondary Objectives:

- Build an exposure- and genomics-based lung cancer risk prediction model
- Compare the proposed model to existing tools (PLCO<sub>2014</sub> and NCC-LCm2021) in never-smoking women

### Exploratory Objective:

- Nested pilot prospective cohort study using low-dose CT imaging and Sybil deep-learning tool to predict lung cancer risk among control participants

## STUDY PLAN

### This is a pilot observational case-control study

- Study procedures include:
  - Questionnaire (~15–20 minutes via REDCap) — all participants
  - Blood draw (1 vial) for whole-exome sequencing — all participants
  - Case patients: Medical record review (staging, histology, treatment, molecular pathology)

### Nested Prospective Cohort Study (control participants)

- Low-dose CT at baseline and 1 year post-enrollment
- Annual health status evaluation (up to 10 years)

## REFERENCES & ACKNOWLEDGEMENTS

1. Chaunzwa T, Gomez D, Ketosugbo K ...P3.01.22 Deep Learning-Based CT Analysis Enhances Lung Cancer Risk Prediction in Never Smoking Women  
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## STUDY DESIGN AND SCHEMA

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ARISE: Assessing Lung Cancer Risk in Never-Smoking Women

Case-control study with a nested prospective cohort (control participants)

Participants (women aged 40-74 who have smoked <100 cigarettes)

- Case patients: Diagnosed with NSCLC
- Control participants: Healthy volunteers without NSCLC, suspicion for lung cancer

Cases and controls frequency-matched by race and age-group

- Asian women oversampled (25%)

Recruitment

- Cases (n=250): from MSK Thoracic DMT
- Controls (n=250): MSK screening mammography program, Mobile Health Unit, Ralph Lauren Center, community outreach

