Study finds biomarker for lung cancer detection in the nasal passages of smokers
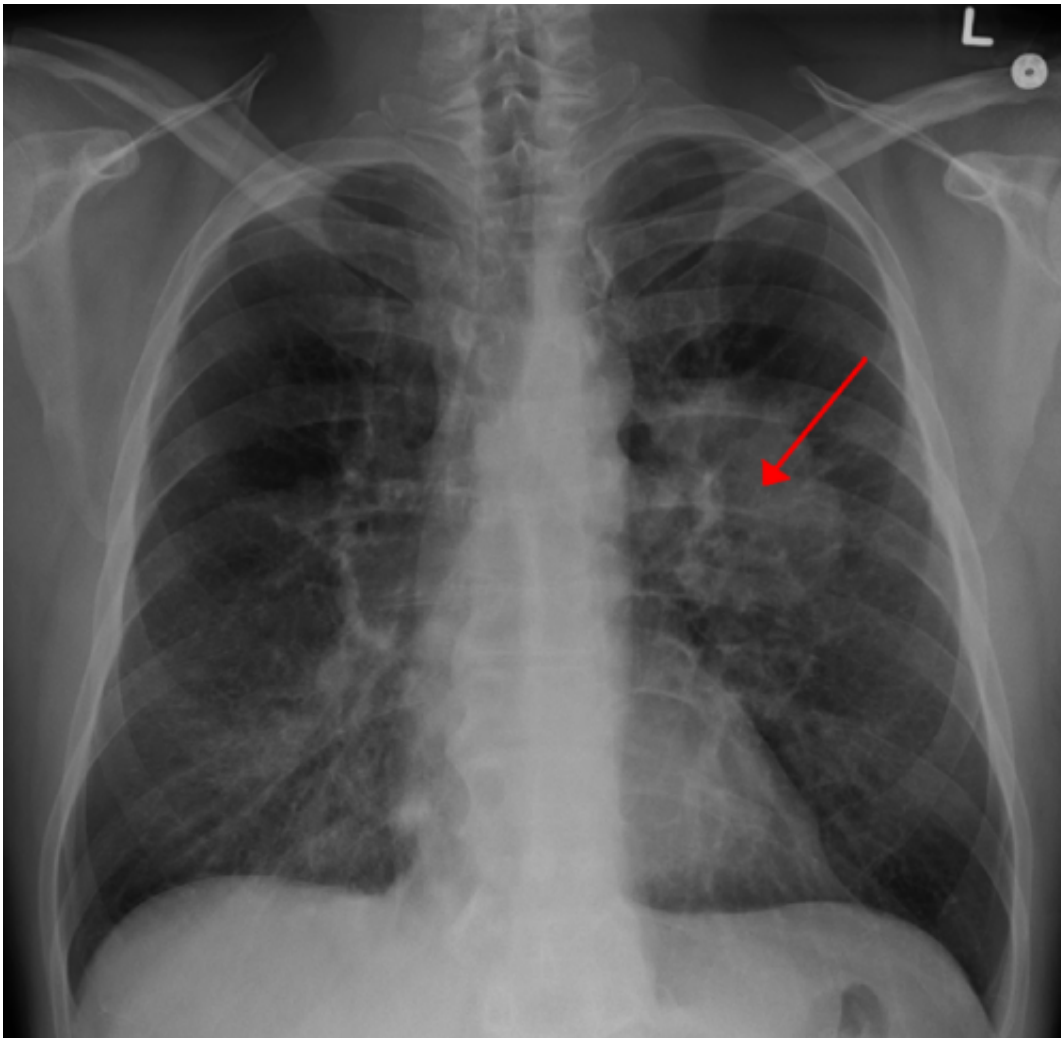
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Lung CA seen on CXR. Credit: James Heilman, MD/Wikipedia

A new nasal test may allow patients suspected of having lung cancer to undergo a simple swab of their nose to determine if they have the disease.

Researchers at Boston University School of Medicine (BUSM) have found that a genomic biomarker in the nasal passage can accurately determine the likelihood of a lung lesion being malignant.

The findings, which appear online in the *Journal of the National Cancer Institute*, will allow physicians to confidently identify patients who are at low probability for having lung cancer, thus sparing them from costly and risky procedures.

The diagnostic evaluation of lung cancer among high-risk current and former smokers with lesions found on chest imaging (computed tomography or CT) represents a growing clinical challenge given the current clinical recommendations for routine CT screening of high-risk smokers. While there are guidelines for the management of pulmonary nodules, unnecessary, invasive follow-up procedures (including surgical lung biopsy) are frequently performed on patients who are ultimately diagnosed with benign disease.

"Our group previously derived and validated a bronchial epithelial gene-expression biomarker to detect lung cancer in current and former smokers. This innovation, available since 2015 as the Percepta Bronchial Genomic Classifier, is measurably improving lung cancer diagnosis," said corresponding author Avrum Spira, MD, MSc, professor of medicine, pathology and bioinformatics at BUSM. "Given that bronchial and nasal epithelial gene expressions are similarly altered by cigarette smoke exposure, we sought to determine in this study if cancer-associated gene expression might also be detectable in the more readily accessible nasal epithelium."

After examining nasal epithelial brushings from current and former smokers undergoing diagnostic evaluation for pulmonary lesions suspicious for lung cancer, the researchers determined that the nasal airway epithelial field of lung cancer-associated injury in smokers extends to the nose and has the potential of being a non-invasive biomarker for lung cancer detection.

"There is a clear and growing need to develop additional diagnostic approaches for evaluating pulmonary lesions to determine which patients should undergo CT surveillance or invasive biopsy. The ability to test for molecular changes in this 'field of injury' allows us to rule out the disease earlier without invasive procedures," added Spira, who is also director of the BU-BMC Cancer Center and a pulmonologist at Boston Medical Center (BMC).

"Our findings clearly demonstrate the existence of a cancer-associated airway field of injury that also can be measured in nasal epithelium," added Marc Lenburg, PhD, professor of medicine at BUSM and co-senior author. "We find that nasal gene expression contains information about the presence of cancer that is independent of standard clinical risk factors, suggesting that nasal epithelial gene expression might aid in lung cancer detection. Moreover, the nasal samples can be collected non-invasively with little instrumentation or advanced training."

Provided by Boston University Medical Center