



STS Press Release

STS Media Contact:

Cassie Brasseur
312-202-5865

cbrasseur@sts.org

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Exhaled Breath May Help Identify Early Lung Cancer

Test is simple, with high accuracy rate

Orlando – Specific compounds found in exhaled breath may help diagnose lung cancer in its early stages, according to a study released today at the 50th Annual Meeting of The Society of Thoracic Surgeons.

The discovery was made when Michael Bousamra, MD and researchers from the University of Louisville examined patients with suspicious lung lesions.

Using a silicone microprocessor and mass spectrometer, the researchers tested exhaled breath for the presence and levels of specific volatile organic compounds (VOCs; aldehydes and ketones, collectively called carbonyls) in patients with suspected lung cancer that was detected on computed tomography scans. The researchers then matched their findings with pathologic and clinical results.

“Although the data are preliminary, we found that patients with an elevation of three or four cancer-specific carbonyl compounds was predictive of lung cancer in 95% of patients with a pulmonary nodule or mass,” said Dr. Bousamra. “Conversely, the absence of elevated VOC levels was predictive of a benign mass in 80% of patients.”

Key Points

- VOCs found in exhaled breath may help diagnose early stage lung cancer.
- Elevation of three or four VOCs was highly specific for lung cancer in patients with a pulmonary nodule or mass.
- Conversely, the absence of elevated VOCs was predictive of a benign mass.

The carbonyl compounds used in the study analysis are a subset of VOCs called aldehydes and ketones, which are organic compounds with a carbon double-bonded to oxygen. These compounds are at very low concentrations and are produced by the human body.

“Instead of sending patients for invasive biopsy procedures when a suspicious lung mass is identified, our study suggests that exhaled breath could identify which patients may be directed for an immediate

intraoperative biopsy and resection,” said Dr. Bousamra. The researchers found that elevated carbonyl concentrations returned to normal following complete resection in patients with a malignant nodule.

“The novelty of this approach includes the simplicity of sample collection and ease for the patient,” said Dr. Bousamra.

The silicone microprocessor used in the study was developed at the University of Louisville. It was coated with an amino-oxy compound that binds to carbonyl compounds in exhaled breath.

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For a copy of the abstract*, contact Cassie Brasseur at 312-202-5865 or cbrasseur@sts.org.

Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 6,800 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society’s mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy.

*The number of patients included in the analysis may differ from what is reflected in the abstract due to further analysis conducted by the authors.