

Noninvasive advanced image analysis could lead to better patient care

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Lung cancer patients could receive more precise treatment, and their progress could be better tracked, using a new high-tech method of non-invasive medical imaging analysis, according to a study published today by the journal *PLOS ONE*.

Genetic changes increasingly are recognized as driving [cancer](#) development. But obtaining evidence of these changes usually requires a biopsy, which can be problematic for sensitive regions of the body such as the lungs.

Based on a review of 48 patients with non-small cell lung cancer (NSCLC), the study found that by scanning their tumor cells using "quantitative computed tomography based texture analysis" (QTA), researchers could determine—with nearly 90 percent accuracy—whether the patient's tumor had a cancer-causing K-ras gene mutation.

The study was led by investigators at the Translational Genomics Research Institute (TGen), the Virginia G. Piper Cancer Center at Scottsdale Healthcare, and Cancer Treatment Centers of America (CTCA).

NSCLC represents more than 85 percent of all lung cancers, which will kill an estimated 159,000 Americans this year, making it the leading cause of cancer-related death. It has a five-year survival rate less than 10 percent.

QTA was shown to be an accurate—and non-invasive—alternative to surgical biopsy and other invasive means of collecting and analyzing biological samples, the study said. This method of making genomic distinctions may help physicians determine the best type of treatment to administer to each patient.

"The ability to rapidly and non-invasively characterize NSCLC tumors would be a great asset to clinical oncologists," said Dr. Glen Weiss, the study's lead author, Director of Clinical Research and Medical Oncologist at Cancer Treatment Centers of America's Western Regional Medical Center in Phoenix, and a Clinical Associate Professor in TGen's Cancer and Cell Biology Division.

"QTA applied to molecularly defined NSCLC cases may have a broader application to precision medicine by offering a non-invasive way of identifying the best therapies for each patient," said Dr. Weiss.

Dr. Ronald Korn, Medical Director of Scottsdale Healthcare's Virginia G. Piper Cancer Center and the study's senior author, described QTA as a substantial step forward in the use of medical imaging: "Non-invasive characterization of a tumor's molecular features could enhance treatment management. Non-invasive QTA can differentiate the presence of K-ras mutation from pan-wildtype NSCLC."

Dr. Korn also is CEO and Medical Director of Imaging Endpoints, a leading imaging core lab that provides centralized image handling and advanced image interpretations for clinical trials. Through Scottsdale Healthcare Research Institute, and in collaboration with Imaging Endpoints Core Lab, this team has developed one of the only global radiology research laboratories that specializes in rapid detection and assessment of response (also known as the RADAR program).

"Although, more studies are needed to move our RADAR program

forward towards routine medical use, our core lab remains focused upon characterizing tumors non-invasively through imaging and then using these technologies to help determine, as soon as possible, whether cancer treatments are working, sometimes within days to weeks after the start of therapy" said Dr. Korn.

Dr. Weiss said future studies using QTA also could help identify other genomic sub-types of NSCLC.

Provided by The Translational Genomics Research Institute

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