

# AI model uses serial imaging to predict lung cancer therapy response

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(HealthDay)—For patients with locally advanced non-small cell lung

cancer (NSCLC), deep-learning networks integrating computed tomography (CT) scans at multiple time points can improve clinical outcome predictions, according to a study published online April 22 in *Clinical Cancer Research*.

Yiwen Xu, Ph.D., from Brigham and Women's Hospital in Boston, and colleagues assessed deep-learning networks for predicting clinical outcomes in locally advanced NSCLC. Dataset A consisted of 581 scans from 179 patients with stage III NSCLC treated with definitive chemoradiation with pretreatment and posttreatment images at one, three, and six months of follow-up. Using single seed-point tumor localization, models were developed using transfer learning of convolutional neural networks (CNN) with recurrent neural networks. Pathologic response validation was performed on [dataset B](#), which included 178 scans from 89 patients treated with chemoradiation and surgery.

The researchers found that survival and cancer-specific outcomes (progression, distant metastases, and local-regional recurrence) were predicted by deep-learning models using time series scans. With each additional follow-up scan into the CNN model, model performance was enhanced. Patients were stratified into low and high mortality risk groups by the models, which were significantly associated with [overall survival](#) (hazard ratio, 6.16). In dataset B, the [model](#) also significantly predicted pathologic response.

"Our research demonstrates that deep-learning models integrating routine imaging scans obtained at multiple time points can improve predictions of survival and cancer-specific outcomes for lung cancer," a coauthor said in a statement.

Two authors disclosed financial ties to the biopharmaceutical and health care industries.

**More information:** [Abstract/Full Text \(subscription or payment may be required\)](#)

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