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AI detects large pneumothoraces on chest x-ray

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Artificial intelligence (AI) algorithms can automatically detect large pneumothoraces on chest x-ray -- potentially speeding up detection and reporting of these critical findings, according to researchers from Philadelphia.

A large pneumothorax is considered a critical finding by most radiology departments. Although large pneumothoraces are fairly apparent to all clinicians and easy to spot on chest radiography, clinical demands may delay the reading of some of these x-rays until hours after they are obtained, according to presenter Dr. Paras Lakhani from Thomas Jefferson University.

"Critical findings including large pneumothoraces may not be detected immediately," he said.

AI could be useful for this application, Lakhani noted.

"For example, such algorithms could process chest radiographs right after they are obtained, and the preliminary AI results could facilitate work prioritization on a reading worklist," he said. "Radiologists could prioritize viewing studies flagged by the AI system as positive, which may allow for more rapid identification of such results."

In their study, the researchers assessed three different deep convolutional neural networks (DCNNs) and found that the best algorithm performed well for detecting large pneumothoraces. It also had no trouble identifying normal radiographs, Lakhani said.

"However, when trying to distinguish large pneumothoraces from potential mimics, such as bullous disease -- large air-filled spaces in the lung often associated with emphysema -- or patients with resolved pneumothoraces with many support devices, the accuracy goes down a little due to false positives," he said. "More training data and other approaches may improve these results."

Learn more by attending this Sunday session.

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