
Radiation Dose Level Affects Size of Lesions Seen On Chest CT Images



The estimated size of chest lymph nodes and lung nodules seen on CT images varies significantly when the same nodes or nodules are examined using lower versus higher doses of radiation, a new study has shown.

The study, conducted at Massachusetts General Hospital in Boston, used a 3D image processing tool to quantitatively measure the volume of the lymph nodes and lung nodules. "We found that lymph node volumes were estimated at 30 percent lower in five cases and 10 percent higher in 15 cases of low dose compared to higher dose images," said Dr. Beth Vetteyil, one of the researchers. The study found that the calculated volume of lung nodules was 46 percent lower in nine cases and 34 percent higher in 10 cases on lower dose as compared to high dose images.

"We were surprised that in both the lymph nodes and lung nodules there were cases in which the lower dose picked up lower lesion volumes as well as higher lesion volumes when compared to the higher dose scans," said Dr. Vetteyil. "We think that increased image noise (graininess of the image) on the lower dose scans may have caused the lesion volumes to vary so significantly," she said.

The study aimed to explore the possibility of using image processing tools to better delineate lesions at low radiation doses without missing any clinical information, noted Dr. Vetteyil. "The study indicates that radiologists can use these types of quantitative tools to supplement them in their measurements, but the use of such software measurements without the radiologist's clinical correlation might not be advisable at this stage," said Dr. Vetteyil.

The study was presented at the ARRS Annual Meeting in Washington, DC on 17 April.

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