

Study concludes that ultralow-dose CT may substitute for standard-dose CT in some COPD patients

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A Japanese retrospective study that reviewed the CT data of 50 emphysema patients found that ultralow-dose CT (ULDCT) can substitute for standard-dose CT (SDCT) in disease quantification if both iterative reconstruction (IR) and filtered back projection are used.

The study, titled "Emphysema Quantification Using Ultralow-Dose CT with Iterative Reconstruction and Filtered Back Projection," was published in the June 2016 issue of the *American Journal of Roentgenology*.

"Although further studies are needed to validate the usefulness of emphysema quantification with ULDCT, we expect that emphysema quantification can be reliably performed with ULDCT both without and with IR to stratify lung cancer risk and reduce the [radiation dose](#) associated with CT screening for lung cancer," said lead author Dr. Mizuho Nishio, of the Advanced Biomedical Imaging Research Center, Kobe University Graduate School of Medicine, Kobe, Hyogo, Japan.

The introduction of MDCT has greatly increased the total number of CT examinations, accordingly raising concerns about radiation exposure and the associated cancer risk. The current principle of clinical CT practice is to use a radiation dose as low as reasonably achievable while maintaining acceptable diagnostic accuracy.

"However, given the trade-off between image quality and radiation dose in CT, excessive dose reduction can interfere with the interpretation and analysis of CT images," Nishio said.

Since the early 1970s, filtered back projection has been used for CT image reconstruction.

It is being replaced, however, by iterative reconstruction (IR), which is becoming widely used to decrease the radiation dose in CT. Many studies have shown that substantial dose savings can be achieved in CT when IR is used.

CT is widely performed in patients with chronic obstructive pulmonary disease (COPD), and this technique allows quantitative evaluation to assess the progression of COPD and to monitor therapeutic effects.

More information: Mizuho Nishio et al. Emphysema Quantification Using Ultralow-Dose CT With Iterative Reconstruction and Filtered Back Projection, *American Journal of Roentgenology* (2016). [DOI: 10.2214/AJR.15.15684](https://doi.org/10.2214/AJR.15.15684)

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