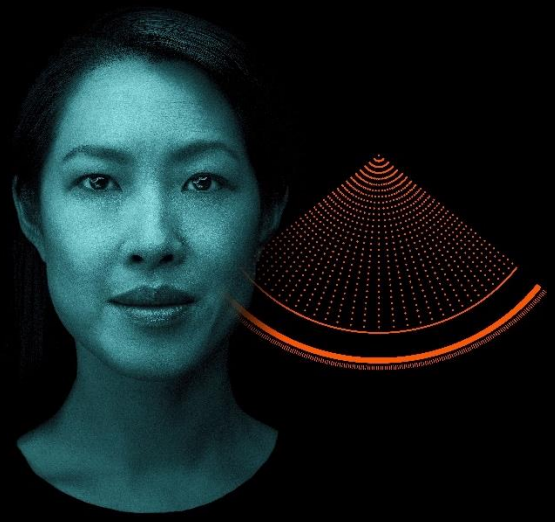
Accuracy of ultralow-dose photon-counting CT in the detection of lung changes after lung transplant

NAEOTOM Alpha
Publication Summary



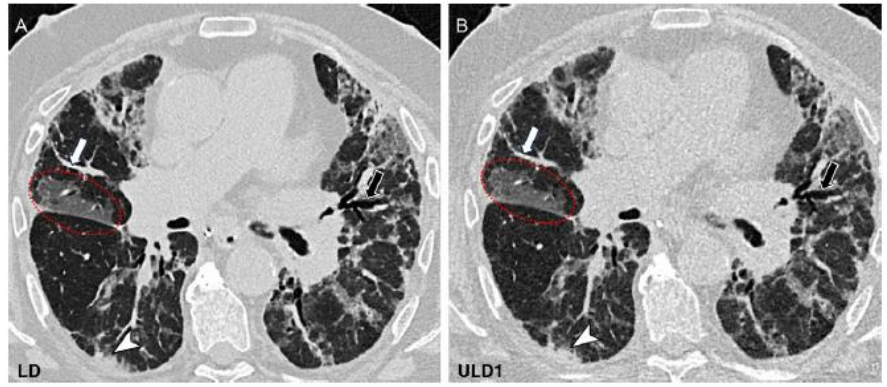
Photon-counting is NAEOTOM

Key findings of the case study

"[…] ultralow-dose (ULD) photon-counting CT (PCT) performed with two radiation dose protocols yielded images of sufficient quality to adequately visualize anatomic structures in 33 of 41 participants (80.5%) to 41 of 41 participants (100%)."

"The two ULD protocols yielded an approximately fivefold and tenfold reduction in radiation dose compared with standard low-dose CT, with mean effective doses of 0.26 mSv ± 0.08 (SD), 0.17 mSv ± 0.04, and 1.41 mSv ± 0.44, respectively."

*"ULD PCT was **feasible for detecting lung abnormalities** following lung transplant, with a **tenfold radiation dose reduction**."*



Chest CT in the craniocaudal direction at inspiration in a 62-year-old male participant with a combination of obstructive and restrictive chronic lung allograft dysfunction 1 year after lung transplant due to fibrosis. **(A)** Standard-of-care low-dose (LD) image (effective dose, 1.77 mSv) and **(B)** ultralow-dose (ULD1) image (effective dose, 0.307 mSv) show a comparison of image quality between protocols. Peripheral vessels (white arrows), bronchiectasis (black arrows), ground-glass opacity (red circles), and small consolidations (arrowheads) seen on the LD image **(A)** have excellent visualization on the ULD1 image **(B)**, which was acquired with a target effective dose of approximately 20% of the LD protocol. The subjective image quality scores of the ULD1 image were 4, 4, and 3 per readers 1, 2, and 3, respectively.

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PCD: Photon-counting detector
ULD: Ultra-low dose

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