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P1.76: Spectral Dual-Energy and Photon Counting Detector Computed Tomography: Applications for Medical Imaging in Stroke Patients

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Dual Energy Computed Tomography (DECT) and Photon-Counting CT (PCCT) provide information about the examined tissue at two/multiple energy levels and therefore offer the possibility to calculate (virtual) monoenergetic images at different energy levels, virtual non-contrast images (VNC), material specific images such as iodine maps and images indicating the atomic number of the scanned materials (z-effective maps). We have investigated the effect of spectral images from DECT and photon counting detectors for neurological applications. Spectral image information improves visualization of ischemic areas in stroke patients, and material-specific images calculated from photon-counting detectors allow differentiation between hemorrhage and contrast within the brain.
In conclusion, DECT and PCCT have the potential to significantly improve the diagnostic decision-making process in stroke patients, especially for advanced characterization of thrombotic material, precise definition of ischemic brain tissue, and material-specific detection of hemorrhage.

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