Photon-Counting Detector Computed Tomography

- Systematic Review of the predictive value of negative brain or low probability brain MRIs in patients with CSF venous fistulas
- Visualization of the middle meningeal artery on photon-counting detector CT: Comparison with energy-integrating detector CT
- Visibility of Intracranial Perforating Arteries Using Ultra-High-Resolution Photon-Counting Detector Computed Tomography (CT) Angiography
- Additional Diagnostic Value of Conebeam CT Myelography Performed after Digital Subtraction Myelography for Detecting CSF-Venous Fistulas
- Ultrahigh-Resolution Photon-Counting Detector CTA of the Head and Neck: Image Quality Assessment and Vascular Kernel Optimization
- Automatic Detection of Directional Lead Orientation in Deep Brain Stimulation using Photon-Counting Detector Computed Tomography: A Phantom Study
- Advanced Imaging of Shunt Valves in Cranial CT Scans with Photon-Counting Scanner
- Three-Dimensional Visualization of Shunt Valves with Photon Counting CT and Comparison to Traditional X-ray in a Simple Phantom Model

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Traditional CT scanners use energy-integrating detectors while photon-counting detectors count individual X-ray photons. Photon-counting detectors offer several potential advantages, including improved image quality, reduced radiation dose, and the ability to distinguish between different energy levels of X-rays.

High-resolution photon-counting CT can very clearly image segmented DBS electrode contacts and directional markers and unambiguously determine lead orientation, with lower radiation than in conventional imaging. This obviates the need for further imaging and may facilitate anatomically tailored directional programming [1)].

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see Photon-Counting Detector Computed Tomography Angiography.

1)

Manfield J, Thomas S, Bogdanovic M, Sarangmat N, Antoniades C, Green AL, FitzGerald JJ. Seeing Is Believing: Photon Counting Computed Tomography Clearly Images Directional Deep Brain Stimulation Lead Segments and Markers After Implantation. Neuromodulation. 2023 Nov 2:S1094-7159(23)00746-8. doi: 10.1016/j.neurom.2023.09.003. Epub ahead of print. PMID: 37921733.