The "Knowledgeable" CT Scanner

Optimization by technological advancements

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1. A 3D camera for body contour detection allows for automated and accurate patient positioning in a CT scanner. *(this thesis)*

2. Radiographers will continue to play an important role in patient positioning by patient guidance and verification of the table height suggested by the 3D camera, especially when fixation aids are used or in patients with physical limitations. *(this thesis)*

3. A calcium-aware image reconstruction technique allows for consistent CT numbers even when applying automatic reduction of tube voltage in coronary calcium scoring. *(this thesis)*

4. A prospective ECG-triggered scan protocol with an absolute scan time, instead of a duration relative to the ECG cycle, prevents an increase in radiation dose and should be considered as the acquisition strategy for imaging the coronary arteries of pediatric patients. *(this thesis)*

5. Dynamic collimators block a large portion of the radiation dose that is irrelevant for image reconstruction, especially the collimators used in a third-generation dual source CT scanner. *(this thesis)*

6. Dynamic CT angiography deserves a prominent place in a diagnostic decision tree for patients with suspected popliteal artery entrapment syndrome. *(Booij, Medical Imaging and Radiation Oncology master thesis, 2017)*

7. Among young adults undergoing body CT, risk of death from underlying morbidity is more than an order of magnitude greater than death from long-term radiation-induced cancer. *(Zondervan et al., Radiology, 2013; 267(2): p. 460-9)*

8. The benefit-to-risk ratio should be 'as high as reasonably achievable (AHARA)' and is the goal for further work on dose issues in CT. *(Adapted from Kalender, Physics in Medicine & Biology, 2014; 59(3): p. R129-50)*

9. With photon-counting detector CT scanners, we are at the doorstep to a new era of CT technology and personalized, functional and precise imaging. *(Adapted from Alkadhi and Euler, Investigative Radiology, 2020; 55(9): p. 545-555)*

10. If we truly want to improve health care with "self-improving machines," we must learn how to work with them side by side. *(Adapted from Pianykh et al., Radiology, 2020; 297(1): p. 6-14)*

11. Books and movies are like apples and oranges. They both are fruit, but taste completely different. *(Stephen King)*