Research studies on Canon Flat Panel Detectors

CONRAD Radiographic Research Centre

• Study 1. Optimization of image quality and dose using multi-frequency software

Purpose: Examine whether the use of multi-frequency software (MLT[S]) may allow dose reduction without significant loss of image quality. The processing parameters explored include brightness, contrast, edge enhancement, frequency band, noise reduction and dynamic range (dark/bright region).

Conclusion: By optimizing image processing parameters, a significant dose reduction of 61% is possible without significant loss of image quality on anthropomorphic phantoms.


• Study 2. Large dose reduction by optimization of Multi Frequency Processing Software in DR within follow-up examinations in pediatric femur

Purpose: Examine whether the use of MFP processing could allow for a dose reduction based on differentiated image quality while still maintaining an acceptable diagnostic image quality in pediatric femur follow-up DR examinations.

Conclusion: By optimizing image processing parameters and to adapt the image quality depending on the requested pathology a significant dose reduction of 92% was shown possible while still maintaining sufficient diagnostic image quality.


• Study 3. New Developed DR Detector Performs Radiographs of Hand, Pelvic and Premature Chest Anatomies at a Lower Radiation Dose and/or a Higher Image Quality

Purpose: Examine whether the new detector design could increase image quality and/or reduce dose in hand, pelvic and premature chest examinations

Conclusion: Optimal image quality can be maintained at a lower dose and/or image quality, and could be improved using the CXDI-70C detector for both hand, pelvic and premature chest examinations, based on the technical and anthropomorphic phantom results. The performance of the CXDI-70C detector in terms of IQFInv values was on average 45 % better than the CXDI-55C detector, depending on anatomy, kVp and mAs levels. According to the VGA results, depending on anatomy and kVp levels, optimal image quality was maintained for the CXDI-70C detector at an estimated dose reduction of 30 % on average


• Study 4. Software optimization in Pediatric Pelvic DR examinations - ongoing

Purpose: To investigate potential image quality optimization or dose savings associated with using the new multi frequency software together with a newly developed DR detector at pediatric pelvic examinations.

Conclusion: By using a new DR detector and optimizing image processing parameters, a significant dose reduction is possible without significant loss of image quality in a pediatric pelvis examinations. Statistical significance was found for processing combinations with the biggest impact from the noise reduction parameter.

Reference: June 2014: Poster and oral presentation at “European Society for Pediatric Radiology”, Amsterdam Scientific article will be published during 2015