

## **BMI Adapted Tube Current Intensity Significantly Reduces Radiation with Coronary CTA**

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Background: The use of low tube voltage (100 kVp) reduces radiation by about 50% when performing coronary computed tomography angiography (CCTA). However its use has been reserved to patients weighting up to 85 kg or with a BMI < 30 for concern of increased image noise. Thus patients weighing > 85 kgs are exposed to high radiation doses.

Objective: To perform CCTA using 100 kVp on patients with a BMI < 35 irrespective of body weight while maintaining good image quality.

Methods : 106 consecutive patients underwent CCTA with 64-slices CT using spiral acquisition. Tube current was 120 kVp for BMI > 35, otherwise 100kVp was used. Tube current intensity was adapted to patient BMI. Tube current modulation was used. Image quality was graded 0-3 (3= best). 27 patients underwent invasive coronary angiography.

Results: 100 kVp was used in 96(90.5%) of patients including in 30 weighting > 85 kg. Estimated radiation exposure (mSv) was 4.5±0.9, 6.4±1.3, 7.5±1.2 and 10.9±2.2 for BMI categories < 25, 25-30, 30-35 and >35. Image noise was constant at 30 ± 5 hounsfield units across all BMI categories. Image quality was 2.9 ± 0.3, 2.8 ± 0.3, 2.5 ± 0.5 and 2.5±0.4 for BMI < 25, 25-30, 30-35, >35 (p<0.05 between BMI >35 and BMI <25 and 25-30). Contrast and signal to noise, were significantly lower for BMI >35 whereas they were constant for the other BMI categories. No patient had a non-diagnostic study. Compared with invasive coronary angiography, CCTA sensitivity, specificity, NPV and PPV were 96%, 67%, 67% and 96% on a patient base (only one false positive and one false negative) and 98%, 98%, 100% and 87% among 456 coronary segments.

Conclusions: CCTA is feasible with 100 kVp in >90% of patients using BMI adapted current intensity. It allows for significant radiation reduction while maintaining excellent image quality and angiographic accuracy.