Impact of Advanced Modeled Iterative Reconstruction on Coronary Artery Calcium Quantification

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RATIONALE AND OBJECTIVES
To evaluate the influence of advanced modeled iterative reconstruction (ADMIRE) on the coronary artery calcium (CAC) scores by computed tomography (CT).

MATERIALS AND METHODS
Sixty patients underwent CAC imaging with dual-source 192-slice CT. Agatston, volume and mass score were calculated from filtered back projection (FBP) and iterative reconstructions with different levels of ADMIRE. Friedman test and Wilcoxon rank sum test were used for multiple comparisons of CAC values and the difference ratio among different ADMIRE groups using FBP as reference.

RESULTS
The median Agatston score (range) using FBP was 115 (0.1-3047) and significantly decreased with incremental ADMIRE levels 1-5: 96 (0.1-2813), 91 (0-2764), 87 (0-2699), 80 (0-2590), 70 (0-2440); all P < 0.001. In comparison with FBP Agatston, volume and mass scores significantly decreased with increasing ADMIRE levels 1-5 (P < 0.001): from -12% to -39%, from -14% to -41%, and from -13% to -40%, respectively. In four patients with low calcium burden, the use of ADMIRE 2 or higher resulted in the disappearance of calcium that was detectable using FBP or ADMIRE 1. The decrease of CAC in high-level ADMIRE resulted in a reassignment to a lower Agatston risk group in 27%.

CONCLUSIONS
ADMIRE causes a substantial reduction of the CAC scores measured by cardiac CT, which leads to an underestimation of cardiovascular risk scores in some patients.