Purpose: To assess image quality and patient dose obtained in multi slice CT studies by means of a standard Filtered Backprojection algorithm (FBP) versus a new type of iterative algorithm called iDose4.

Methods: Various scans on a Catphan600 phantom (The Phantom Laboratory) were performed with a Brilliance iCT-256 scanner (Philips Healthcare) varying reconstruction algorithm (FBP and iDose4 with six different levels), kernel (B-D-YB), and dose. Image quality has been compared through the following figures of merit: signal-to-noise ratio (SNR) for low-contrast resolution and MTF-50 for high-contrast resolution. Images were analysed with IQworks. Dose was varied through the mAs/slice mean value set to scan the phantom. The fixed scan parameters used for all the studies were: HV=120kVp, FOV=250mm, pitch=0.993, slice thickness=2.5mm, rotation time=0.75s, matrix size=512x512.

Results: With kernel B and 78mAs/slice the following SNR values have been measured: FBP 1.48, iDose4 (levels 1 to 6) 1.62, 1.70, 1.82, 1.98, 2.28, 2.54; for MTF-50 results were: FBP 3.5 lp/cm, iDose4 (levels 1 to 6) 3.4 to 3.5 lp/cm. With FBP (kernel B) and mAs/slice ranging from 78 to 156 results for SNR were: 1.48-2.12 (R2=0.998), and for MTF-50: 3.4-3.7 lp/cm. Equivalent values of SNR (1.81) and MTF-50 (3.5 lp/cm) were obtained with iDose4 level 3-kernel B-78mAs/slice and with FBP-kernel B-117mAs/slice. MTF-50 as a function of the kernel varied from 3.5 lp/cm (B) to 6.2 lp/cm (YB), almost independently from dose and reconstruction algorithm.

Conclusions: Phantom assessments showed that the use of the iDose4 algorithm compared to FBP allows SNR to increase up to 70% at equal patient dose and permits to reach a 33% patient dose reduction at equal values of SNR and MTF-50, SNR being the limiting factor. Higher dose reductions seem to be achievable, possibly up to 70%, if high-contrast resolution is the most critical factor (e.g. vascular studies).