Abstract ID: 16506 Title: How much CT radiation dose can model based iterative reconstruction (VeoTM) save? -- A physical evaluation of the image quality using standard phantoms

Purpose: This study is a comparative evaluation between Veo, GE Healthcare's model based iterative reconstruction engine, and contemporary filtered backprojection (FBP) techniques. The purpose is to estimate Veo's ability to produce diagnostic image quality at reduced dose levels.

Methods: Standard image quality metrics were measured at different dose levels using physics phantoms commonly found in clinical settings. A GE multi-slice CT system was used to scan a CATPHAN600® phantom in order to compare the noise and signal properties of FBP and Veo; tungsten wire phantoms were used to characterize high contrast spatial resolution between the two reconstruction algorithms. Three routine clinical protocols were tested: head, adult abdomen, and pediatric. Baseline FBP dose levels for each protocol were determined by the mean noise index from a large international database of scan histories. The metrics used in this study include MTF, noise power, contrast to noise ratio, and statistical low contrast detectability.

Results: All of the tested metrics showed improved performance for the Veo at equal dose. Measurement differences between full dose FBP and 1/4th dose Veo were found to be statistically insignificant, indicating similar image quality

Conclusions: Veo reconstruction produces higher image quality than FBP at all measured dose levels and has the ability to greatly reduce the dose of routine CT imaging, as observed from standard physics phantom evaluation.