

AbstractID: 9311 Title: Dynamic Volume CT: Technical Aspects and Image Quality of the Aquilion ONE

Purpose: In order to cover entire organs, multislice CT requires helical acquisition. This need for table motion in multislice CT causes image volumes acquired for whole organ motion and perfusion studies to lack temporal uniformity. Dynamic volume CT mitigates this limitation by providing the ability to acquire an entire organ with isotropic resolution in a single gantry rotation with no table movement. The purpose of this study is to examine the technical aspects of the Aquilion ONE, the first dynamic volume CT scanner, and the effect on image quality versus a standard 64-slice system.

Method and Materials: An Aquilion ONE with a detector configuration of 320x 0.5mm channels is examined and compared to an Aquilion 64 with a 64x0.5mm detector configuration. Studies performed include low contrast resolution, high contrast resolution, uniformity, slice sensitivity profile, and CT number accuracy. These studies were performed using a CATPHAN 500.

Results: The technical challenges associated with dynamic volume, such as cone beam reconstruction, and their physics implications, such as image clipping, will be presented. It will be shown that low contrast, high contrast, slice sensitivity profile, and CT number accuracy are equivalent to a standard 64-slice system. Some differences in uniformity were found and will be discussed.

Conclusion: Dynamic volume CT allows clinicians to visualize contrast flow, motion dynamics, and entire volumes at a single instant in time while maintaining the image quality found on current systems. Dynamic volume CT promises to transform the way medicine approaches stroke patients, myocardial perfusion studies, and imaging of other moving body parts such as the lung and joints.

Conflict of Interest (only if applicable): Both authors are employees of Toshiba America Medical Systems