AbstractID: 4638 Title: Investigation of the Perspecta Display for 4D Visualization

Purpose: Recent advancements in radiologic imaging (IGRT) have acquired 4D anatomic data permitting characterization of organ motion towards improving radiotherapy delivery. For radiation oncology patients, images illustrating temporal migration or tumor motion as a result of innate biological function can provide significant benefit towards improving target accuracy and minimizing healthy tissue dose. This study examines the utility of the Perspecta Spatial 3D system (Actuality Systems Inc) to display dynamic 3D data in comparison to flat panel 2D displays. **Method and Materials:** The AqSim (Philips Medical Systems) CT scanner was used to obtain scans of a patient with lung cancer, and entered into the Pinnacle^3 treatment planning system (Philips Medical Systems). A clearly delineated lung tumor was contoured in each pertinent CT slice. Ten scans (64 slices each) were obtained during the breathing cycle. Data were viewed side-by-side on a flat panel display and the Perspecta 3D system for comparison. **Results:** The Perspecta display permitted simultaneous visualization of ten CT scans at ~ 1 Hz per dataset which was similar to the natural breathing rate during image acquisition. Optimal static beam orientation for dynamic target coverage and OAR avoidance was more easily accomplished on the Perspecta than on the 2D display. **Conclusion:** The 3D Perspecta display successfully depicted anatomic motion, clearly indicating tumor and OAR motion. In comparison to the 2D flat panel display, the Perspecta display permitted the radiation oncology team to readily visualize the temporal nature of lung tumor location for consideration during treatment planning. This application could play an important role in defining and displaying 4D patient data, which was previously relegated to predominantly 2D RTP systems. Furthermore, breath-hold and coached breathing techniques may be quantitatively evaluated using this method. **Conflict of Interest Statement:** Actuality Systems Inc. provided the 3D display used in this study.