AbstractID: 11700 Title: Volume Viewer: A segmentation and surface reconstruction toolset for non-transverse image planes

Purpose: To develop novel segmentation software that allows users to segment regions of interest and reconstruct three-dimensional surfaces using non-transverse image planes. **Method and Materials:** To date the manual segmentation process in radiation oncology has been performed on consecutive transverse computed tomography (CT) image planes. This method of contouring provides little information about the ends of a structure and is poorly suited for structures whose longitudinal axis lies oblique to the transverse plane. Due to these limitations it has been illustrated that the segmentation of structures using only transverse planes is prone to error and time consuming in nature. We hypothesize that the intelligent selection and use of non-transverse image planes will reduce observer error and the time burden of the segmentation process. At present few treatment planning systems offer segmentation in non-transverse planes. The development of this software has four phases: 1) Navigation and segmentation toolsets. 2) Segmentation validation. 3) Curve and vertex processing. 4) Three-dimensional surface reconstruction. **Results:** The first and fourth phases are complete. Phases two and three are currently underway with data from a user study illustrating process improvements to be addressed by our software. Our initial results are promising and indicate that it is possible to generate accurate surfaces with a significant reduction in the segmentation burden. **Conclusions:** The current method of manual structure segmentation is not ideal and represents a significant bottleneck in the treatment planning process. This software promises to improve the accuracy and efficiency of the segmentation process through the use of non-transverse image planes. While this software was specifically developed to improve the segmentation process, we feel the use of non-transverse image planes is directly applicable to segmentation and dose distribution review.