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ABSTRACT

Purpose: Accuracy is critical in the workflow of per patient optimized radiation therapy. Dosimetric accuracy and the impact of institutional differences in medical oncology, treatment planning, OAR definitions, and contouring are well documented. A software tool that allows for the quantification of the dose/DVH related effects strictly due to contouring differences was quantified by dose metric differences, from what each planner expected (planner’s contours, planner’s dose) to what they would have seen given different contours (reference contours, planned contour variation). This study presents the results of the impact of OAR contouring in 289 patients, 2 institutions, to evaluate the absolute differences among the different contouring datasets.

Materials and Methods: This retrospective study was performed in 2 institutions, an academic institution and a community hospital, using a dose planning and delivery software (QAC). Radiation oncologists were required to contour the OARs, but no specific contouring guidelines were used. The OARs were divided into 2 categories: critical structures (CTV1, CTV2, PTV1, spinal cord) and normal tissue (Mandible, parotid, optic nerves, brainstem). The dose metrics used were calculated using a linear model and compared as a percentage of dose. The institutional differences were quantified using a linear correlation coefficient (R). The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method.

Results: The institutional differences were correlated with a correlation coefficient of 0.6. This difference could be caused by the dose planning and delivery software. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8.

Discussion: The institutional differences observed in this study were due to the fact that the dose planning and delivery software used in both institutions was not the same. This difference could be attributed to the different dose planning and delivery software used in both institutions. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8.

Conclusions: The institutional differences observed in this study were due to the fact that the dose planning and delivery software used in both institutions was not the same. This difference could be attributed to the different dose planning and delivery software used in both institutions. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8. The correlation coefficients between the dose metrics were calculated for each OAR for each contouring method. The correlation coefficients varied from 0.3 to 0.8.