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# Stereotactic Radiosurgery Plan Comparison Study of Eclipse/Truebeam Platform vs Zap-X

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**Abstract**
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## Abstract

Objectives:

This study will evaluate workflow and plan quality metrics for SRS cases planned for both the Truebeam and Zap-X delivery platforms.

Methods:

Our institution is able to perform radiosurgery on either a Truebeam with HDMLC or on a Zap-X. As our patient selection criteria for the Zap-X evolves, we are redundantly planning patients' cases on both systems to compare plan quality metrics while also evaluating the time inputs required for each systems' workflow. The CT simulation setup differs depending on which platform a patient will be treated on, specifically the CT couch overlay and mask system. To minimize duplicate CT simulations and CT scans, we devised a method to utilize either CT simulation dataset for planning in both Eclipse and the Zap-X treatment planning software. Thus a single CT and Structure set will be utilized to generate SRS plans for dosimetric comparison. Additionally, this enables us to replan historic Truebeam patients in the Zap-X planning system to add to the study dataset. Workflow comparison metrics will include planning time, patient specific QA delivery time, and patient treatment delivery time. Dosimetric comparison metrics will include but are not limited to: Target coverage, Conformity Index, Gradient Index, Homogeneity Index, and relevant OAR constraints. Plans will be generated with the intent of having them be clinically acceptable for actual treatment and plan normalization will be selected to provide equivalent target coverage with the prescription dose. To ensure consistent evaluation, an independent software will be used to compute the dosimetric metrics for comparison of the plans from both systems.

Results:

Preliminary results indicate the Gradient Index is very good for Zap-X plans, however the time inputs are much higher for Zap-X planning, QA, and treatment delivery. The statistics are evolving as additional plans are generated for the study comparison.

Conclusion(s):

The implementation of new technology into clinical practice should be compared against current methods to ensure clinical competency with the new technology and to ensure that plan quality is maintained. Furthermore, differences in delivery technique arising from different beam geometry, energy, SAD, etc. will naturally result in dosimetric differences that are interesting from a plan quality metrics perspective. New technology is also accompanied with hidden costs of time and labor which are considerations in a community clinic. As we gain greater experience with the Zap-X system, we hope to see improvements in the time inputs per patient. We also hope to develop criteria to aid in determining if there are patient characteristics that would make them better candidates for treatment on one delivery system or the other.