

Purpose:

To import Gamma Knife treatment plans into an environment that allows for comparison and combination dose distributions with those from other treatment planning systems to include those for linear accelerators.

Method and Materials:

A set of software tools were developed that allow the binary files of GammaPlan, version 5.4, for Gamma Knife, Model C, to be converted and imported into CERR, version 3.0. The imported data files include CT scan sets, MR scan sets, anatomical contours, the location of the dose matrix relative to patient anatomy, the dose computed by GammaPlan. The functionality of CERR allows us to fuse image sets, contours and doses.

Results:

We were able to import GammaPlan treatment plan data into CERR for comparison and combination with a Varian Eclipse/Helios treatment plan for recurrent tumor in the same patient. The recurrent tumor extended into anatomical regions that precluded re-treatment with the Gamma Knife, Model C. This allowed superposition of isodose distributions of the two treatment plans in one viewable format. Areas of dose overlap for the two plans were identified and the progression of disease relative to the initially treatment location was observed.

Conclusions:

The software tools extend the capabilities of CERR to view GammaPlan treatment plans and combine the doses from other treatment planning systems supported by CERR. Further work will incorporate full plan specifications, including shot locations, gamma angle, and time for each shot so that CERR can export in DICOM RT format. These tools provide the potential for multi-institutional stereotactic radiosurgery trials that include participation of the Gamma Knife, Model C.