

## AbstractID: 10458 Title: Head-and-Neck IMRT without Beam-Splitting

**Purpose:** Varian MLC leaf travel is limited to 14.5 cm. For large PTV, an IMRT field will be split into two or three sub-fields. Thus a 9-beam head-and-neck plan may end up with 18 or more treatment fields. The purpose of this study is to develop a non-split IMRT planning technique and compare the quality of non-split plans with beam-split counterparts. **Method:** Varian Eclipse user can choose fixed-jaws and set field-size less than 14.5 cm so that IMRT field will not split. A small part of the PTV may be blocked by x-jaws in a particular beam, but the missing dose from one beam can be covered by other beams at different gantry angles. We compared our previously treated 9-beam-split-18-field head-and-neck IMRT plans with corresponding non-split plans of 9, 11, and 15 gantry angles. Plan DVH and IMRT QA results were analyzed. **Results:** Non-split plans produced the same dose coverage as beam-split plans. DVH curves of PTV for split and non-split plans almost overlapped with each other. DVH of organs-at-risk were slightly different. Total treatment MU were about the same for all the plans. All IMRT QA plans delivered on a Varian Trilogy passed physics QA criteria, with non-split plans showing slightly better passing scores. **Conclusions:** Creating IMRT plans without beam-splitting is encouraged. Non-split IMRT plans can be as good as beam-split plans, but use only half of the number of beams. Quality of non-split plans improves with increasing number of beams. The amount of improvement was larger for the number of beams going from 9 to 11 than that from 13 to 15, demonstrating a balance of costs and benefits. Cutting the number of beams by half may result in a number of benefits: more accurate dose delivery, shorter treatment time, and increased machine throughput and productivity.