

# AbstractID: 6548 Title: Evaluation of Multiple-Isocenter IMRT Planning Technique for Field Matching with Limited Collimator Field Size

Evaluation of Multiple-Isocenter IMRT Planning Technique for Field Matching with Limited Collimator Field Size  
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**Purpose:** The Elekta Beam Modulator with fully integrated miniMLC has the precision suited for the treatment of smaller tumors. However, the maximum collimator length in the inf/sup direction is 16 cm when most of the head and neck target sizes have a larger dimension. This study used a multi-isocenter IMRT planning technique with overlapping fields generated using inverse planning. Measurements have been taken to evaluate plans in terms of volume dose and delivery accuracy. The total monitor units for this technique were compared with a standard IMRT plan.

**Methods and Materials:** Ten patients were planned with multiple beam arrangements; eight beam directions for the upper tumor volume without the supraclav and three to four beam arrangements for the lower tumor volume and supraclav. Treatment planning was performed on a CMS/XiO workstation. Treatment fields were delivered on a flat acrylic phantom containing EDR2 film. Isodose distributions were exported from XiO and compared to the measured data using Omni-Pro software.

**Results and Conclusions:** Multi-isocenter techniques provide good coverage to the tumor volume while sparing organs at risk. Film distributions show that XiO does not model the effective tongue and groove that is evident in the film measurement. The magnitude of the tongue-and-groove dose decrease is on the order of up to 10%. An analysis of the gamma values shows that even with this discrepancy the agreements between plan and measurement were acceptable. The plans are not significantly degraded with small table inaccuracies on the order of 2mm. The total monitor units for multi-centered plan increased 20% compared to single isocenter delivery.

IMRT planning techniques using two or more isocenters for this collimator show clinically acceptable results when splitting the geometry.