AbstractID: 3665 Title: IMRT treatment planning for Mantle fields.

Purpose: To develop a method for Mantle field IMRT treatment planning using commercially available equipment.

Method and Materials: In this study all plans were created for a Siemens Primus linear accelerator on a Philips Pinnacle Treatment Planning System. A crucial feature of the treatment planning system was the capability to create dose-based regions of interest (ROIs). The Siemens accelerator was chosen for its ability to deliver treatments using magna fields without field-splitting. Patients were CT scanned and the data transferred to the planning system. Traditional mantle fields, including 50% transmission lung blocks, were drawn on the AP/PA digitally reconstructed radiographs. An initial plan with equally weighted AP/PA beams was set up with a homogeneous calculation to a point at mid separation. The 50% isodose curve of the resultant distribution was contoured and converted to a physical target volume. The isodose representing the involved lungs under the partial transmission blocks was also contoured and converted to a second ROI target. The lungs were manually outlined as critical structures. An IMRT plan with DVH-based target objectives was performed and compared with a protocol-based 3D conformal plan.

Results: Creation of ROIs using dose contouring was determined to be straightforward and reliable. IMRT optimization using the ensuing ROIs was found to be reproducible and robust. For the case study presented, the 3D plan showed a 37.0% decrease in the ICRU defined conformity index for 100% of the prescribed target dose and an undesirable 63.5% increase in the volume of lung receiving 80% of the prescribed dose.

Conclusion: IMRT mantle treatment planning can easily be performed in under an hour using commercially available equipment. Unlike the traditional approach with no defined target, this procedure allows for quantitative plan evaluation using both isodose distributions and dose volume histograms.