

## AbstractID: 1265 Title: Dosimetric Comparison of Inverse Treatment Planning Systems for Intensity Modulated Radiation Therapy: A Collaborative Study

A large numbers of treatment planning systems (TPS) are now providing various forms of inverse planning with different fluence mapping and optimization routines for intensity modulated radiation therapy (IMRT). These algorithms use different calculation engines and inhomogeneity corrections. The accuracy, precision and limitations of the TPS cannot be verified independently by one institution and hence a collaborative approach (8 institutions) was undertaken to investigate a comprehensive and controlled study for 11 commercially available TPS today in the market. The study intended to answer three questions; the merit and characteristics of TPS in inverse planning, impact of leaf width on dose distribution and degree of confidence in calculated dosimetry based on measured data in IMRT fields. A single CT data set for prostate, lung, and head and neck cases with target volumes and the organ at risks (OAR) were sent to each collaborative member. Beam arrangements, dose volume constraints and a maximum grid size were kept constant. For the case of prostate, lung and head and neck cases, 7, 5 and 9 equally placed field arrangements, were chosen using a 6 MV beam. The calculated DVHs, phantom plans and measured data were collected and compared. Results show a wide variation in DVHs of OARs when the PTV dose was kept constant and significant variations in hot spots is noted. Comparison of DVHs with each case will be presented, however, results indicate that TPS have evolved to provide a varied degree of sophistication in IMRT algorithm, outcome, speed and accuracy.