

AbstractID: 3661 Title: Treatment optimization for prostate IMRT incorporating utility analysis and patient decisions

Purpose: Radiation target dose, target margin, and the doses to the surrounding normal tissues are traditionally applied in a standard way (e.g., 76-78Gy to patients with intermediate to high risk prostate cancer). The hypothesis here is that quality of life will be improved on an individual basis by allowing these aspects to vary, within limits, based on the preferences of a given patient in terms of local control and normal tissue toxicities. The goal is to develop planning methods for incorporating utilities.

Method and Materials: Patient utilities are individual valuations of various health states. Through the incorporation of utilities in the IMRT planning process, the treatment may be tailored to the individual patient desires. The assessment of utilities is ongoing. In this study, DVHs for the target and critical organs are used to estimate tumor control and normal tissue complications and then converted to utility scores. We included utility assessment for baseline general health, and urinary, sexual, and bowel functions. Preliminary results are based on multiple IMRT plans using a commercial TPS. An automated planning process is being developed using a home-grown optimization system.

Results: Outcome data from the literature and our own institution are used to establish a consistent DVH-utility conversion system. Although such a scoring system is based on the mean values of a patient population the changes in the utility scores for a particular patient are relative and relevant based on the dosimetric changes in the treatment plans. Emphasis is given to dose in the target, rectum, bladder and erectile tissue to maintain the balance between local control, rectal/bladder bleeding, urinary functions and impotence. Patients are given the opportunity to make treatment decisions by selecting personalized utility criteria.

Conclusion: Treatment optimization based on utility analysis allows both the oncologist and patient to make personalized treatment decisions.