

AbstractID:9547Title :A Feasibility Study of CT -based IMRT Planning for Total Body Irradiation

Purpose: In this study we explore a patient positioning option that allows sufficient CT scan acquisition for total body IMRT. We currently perform hand calculations of monitor units and compensator design based on a few direct patient measurements and a limited number of axial CT slices. The SSD available in our treatment room results in a treatment position not suitable for a full body scan.

Methods and Materials: Option (1) has the patient lying down in a bent knee position and scanned in two parts. In-house software combines the two image sets into one complete full body scan. Treatment is via two lateral fields at extended SSD. IMRT plans are generated on CMS XiO and compared with Monte Carlo Treatment Plan. Comparisons of plans mimicking our current practice of using two opposed lateral beams are made. In option (2) the patient is treated AP/PA at 180cm SSD. Full body scans are acquired with the patient lying straight in two parts. The patient is placed on a low cart for treatment and flipped for the PA fields. Three fields are needed to cover the whole body. An IMRT plan is generated on XiO.

Results: DVH comparisons between XiO and Monte Carlo indicate that XiO underestimates high dose and overestimates low dose. The maximum lung dose and overall dose coverage is lower than hand calculated values in our current protocol.

Conclusion: Both methods of CT-based IMRT are feasible and offer improved distributions and lung sparing. The first approach offers a convenient treatment position but requires extended SSD not available in all treatment rooms. The second approach is suitable for treatment in all treatment rooms but adds setup uncertainties and increased treatment time. Comparison of XiO plans with Monte Carlo simulation indicates that an extended SSD beam may have to be commissioned for XiO.