AbstractID: 10979 Title: Quality Assurance of IMRT plans using IMSure QA^{TM} Software as a substitute for measurement

Purpose: To study appropriateness of replacing patient-specific IMRT QA with independent calculations using IMSure QA software. Also, our aim was to develop acceptability criteria of IMRT plan QA and to determine site-specific recommendations. **Method and Materials:** Point dose data and fluence maps from Eclipse treatment planning system, IMSure, and measurements were compared for head and neck and prostate IMRT plans. In all 25 prostate and 20 head and neck IMRT plans were included in this study. A three-dimensional portal image-based dose reconstruction program in a virtual phantom (Epidose) was utilized for the comparison of the isocentre dose with Eclipse. **Results:** For 5-field prostate IMRT plans, the average percentage discrepancy between IMSure and Eclipse was 0.3% with two third of the data agreed between +/- 0.5%. While the average discrepancy between Epidose and Eclipse was -0.3%+/-0.6%. Similar results were obtained for the 7–field IMRT head and neck; the average discrepancy between IMSure and Eclipse was -0.7% +/-0.8%, while the average discrepancy between Epidose and Eclipse was 0.1% +/- 1.4%. Fluence map comparison of pixels was performed and gamma function values were calculated. The results for the 2% and 3% level discrepancies were derived for prostate and head and neck cases, respectively. For prostate, the average percentage of cells failing the 2% limit was 4.2%+/-1.5%, while for head and neck with 3% limit it was 7.5% +/-2.6%. **Conclusions:** Our investigation of the IMSure QA software for IMRT showed good agreement with both Eclipse treatment planning system and EPIDOSE measurements to within 1%. The results showed that IMSure software can be a reliable tool for IMRT QA, and measurements need to be invoked only for few select patients (less than one third) when point dose discrepancies exceed 1% for prostate and 2% for head and neck cases.