AbstractID: 5376 Title: In vivo Prostate IMRT Dosimetry With MOSFET Detectors Using Brass Build-up Caps.

Purpose: To develop a general formalism with various correction factors to predict dmax entrance dose with the new hemispherical brass buildup caps to be used with MOSFET detectors in anterior prostate IMRT fields and thereby integrate in vivo IMRT dose measurement as part of routine QA process in IMRT radiotherapy

Method and Materials: We have used the new wide energy hemispherical build-up caps for this study. Due to its high density and high atomic number it provides the minimal amount of metal needed to achieve full build-up at Dmax for a range of photon energies. We have developed a general formalism to predict Dmax entrance dose by applying necessary correction factors after studying the response of MOSFET with brass build up caps for energy, dose rate, dose reproducibility, SSD and patient specific IMRT correction factor.

Results: In vivo Prostate IMRT dose measurements with MOSFET detectors using brass buildup caps was performed and compared against dose predicted by two different treatment planning systems. We used both 6 MV and 10 MV for this study and compared the in vivo MOSFET detector reading with dose predicted by Philips Pinnacle (6 MV) and CMS XiO (10 MV) treatment planning systems respectively. We achieved a overall accuracy of better than ± 5% on measured patient doses .

Conclusion: Routine IMRT QA in most institutions today only involves verifying the optimized fluence map delivered to the patient in a test phantom at a certain preset depth. Based on our work here, we believe adding in vivo IMRT dosimetry with MOSFET detectors using the new brass build up caps along with routine fluence map verification in phantoms and MLC quality assurance offers greater accuracy and confidence in actual dose delivered to the patient**.**