AbstractID: 7487 Title: Alternative IMRT QA technique during prostate patient treatment

Purpose: The objective of this study is to propose an alternative QA technique that addresses concerns of conventional IMRT QA.

Methods and Materials: During IMRT patient treatments, delivered doses were measured using film and MOSFET detectors. Film was placed under the patient sandwiched between the patient and 1-cm bolus; MOSFET detectors were placed on the anterior skin near the central-axis under 0.5-cm bolus. IMRT QA was also performed by exporting the patient plan into a 30x30x30 cm^3 cubic phantom. In addition to the central axis dose, relative dose distributions were measured using XV films placed near the anterior and posterior surface of the QA phantom.

Results: The results of *in-vivo* measurement with film placed under the patient indicate good agreement between planned and measured doses with gamma index of 0.8. Anterior surface doses measured with MOSFET detectors however deviated from planning dose around 10-15%. For comparison, the same patient plan was also exported into the phantom for IMRT QA. The ion chamber measurement at the phantom's center showed good agreement with TPS (measured dose = 197±1 cGy). Results of surface doses measured with film in phantom agree with planned doses. This is consistent with *in-vivo* measurement of dose distribution during patient treatment. The surface dose measured with film placed under the patient samples doses at different depths from various beams. The quality of agreement seen with films is consistent with the ion chamber data at the central axis. Thus, film based surface dose measurement is a good manifestation of central axis dose.

Conclusion: An *in-vivo* IMRT dose measurement is proposed as an alternative QA procedure. Based upon our measured data, proposed method is an accurate and reliable verification of patient dose. The technique is quick, efficient, and directly measures actual dose received by patient during IMRT delivery.