AbstractID: 13050 Title: Daily evaluation of in vivo dose verification device

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Purpose: To evaluate daily and overall performance of an in vivo dose verification device.
Methods and Materials: Five patients were used to evaluate the response of the in-vivo measurement device DAVID (PTW Freiburg GmbH, Germany) against an ionization chamber array (I'mRT MatriXX, IBA dosimetry, GmbH, Germany). For each patient, two almost equivalent plans were created in Eclipse. The plans were optimized using 5 to 7 static IMRT beams delivered using sliding window and RapidArc. The treatments were delivered using a Varian Clinic 2100 C/D with a 120 leaf Millennium MLC. Each plan was measured by both detectors for six days. The PTW DAVID software automatically compares the reproducibility of each treatment to the reference measurement. Using the OmniPro-IMRT software, the daily planar dose distribution was compared to the reference, and the gamma index was calculated using 2%- 2mm. For each type of IMRT treatment, the PTW DAVID day-to-day measurements were recorded and compared.
Results: The day-to-day differences measured by PTW DAVID were up to 8% and 5% for RapidArc and IMRT sliding window deliveries respectively. The corresponding RapidArc gamma index calculations ranged from 91% to 100% pass rate but no correlation between PTW DAVID and I'm RT MatriXX measurements was observed. Overall, the dose measurements with the I'm RT MatriXX had less variability than with IMRT sliding window, while the opposite was observed for the PTW measurements.
Conclusion: An in vivo measurement device for daily QA of the delivered dose was evaluated for its reproducibility. Our results show that the overall good reproducibility of the device is observed when used for RapidArc and IMRT sliding window plans. However, the in vivo daily variations did not correlate to similar dose variations as measured by an ionization chamber array.

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