AbstractID: 13555 Title: Comparison of four different commercial devices for Rapid Arc and Sliding Window IMRT QA

Purpose:
The aim of the study is to evaluate and compare the four different commercial devices for Rapid Arc and Sliding Window IMRT QA.

Materials and methods:
Fifteen consecutive RapidArc plans and ten IMRT plans were used for this study. All plans were optimized using Eclipse TPS. For all plans, the corresponding verification dose distributions were calculated using four (n=4) geometries. This include an acrylic phantom with film, the IBA with the MatrixX, the PTW Octavious phantom with the seven29 array, and the Scandidos Delta4 device. All plans and deliveries were calculated and delivered using the actual planned gantry and collimator angles respectively. All measurements were compared against the calculated ones, first by taking into account all points in the measurement planes and second by applying a threshold value where the points that received less than 20% of the normalized dose were excluded from the gamma index calculation.

Results: Among these 25 plans, using all available points for the gamma calculation, all of them passed the criteria (3.0% and 3mm DTA) of having gamma values ≤ 1 (more than 90% of points). A few verification plans failed to pass the set gamma criteria when the evaluated points were limited to those only receiving more than 20% of the maximum dose. On average all the QA devices produced very similar results. This was further supported by the Bland-Altman analysis that was performed and showed that all the calculated gamma values of all detectors were within 5% from those of film.

Conclusions:
The results showed that there insignificant differences between the detectors. All patient QAs passed the routine clinically criteria of gamma index values of 3% dose difference and 3mm DTA. We conclude that the dosimetric systems under investigation can be used interchangeably for routine patient specific QA.
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