AbstractID: 12731 Title: Quality Assurance measurements for Varian/ RapidArc

Purpose:
As Varian revealed “RapidArc radiotherapy technology is a major advance from Varian Medical Systems that improves dose conformity while significantly shortening treatment times.” It delivers IMRT treatment plan with 360 degree rotation of linear accelerator gantry. The purpose of this analysis is to perform Quality Assurance measurements by using regular IMRT QA tools to verify the doses delivered with the new RapidArc radiotherapy technology.

Method and Materials:
20 treatment plans had been validated which generated from VARIAN/ Eclipse (RapidArc Progressive Resolution Optimizer V.8.6.15). All plans were measured with two different dosimetric systems. The first system included Plastic-Water phantom, EDR2 films (Kodak), Ion Chamber (Wellhofer) and Electrometer (FLUKE F35040). The other system contained PTW “Seven-29 Ion Chamber Array” with two 5-cm thick Plastic-Water phantoms. Film Dosimetry was performed by VIDAR's DosimetryPRO Advantage film scanner. The dose distribution analysis and comparison were completed by PTW/ VeriSoft tool to verify dose distributions measured in phantom with dose distributions computed by a RTPS using RapidArc radiotherapy technology.

Results:
The results show both Dose measurements are within acceptable criteria (the ±5% tolerance limit). The data from ion chamber measurements shows %Diff are within 2%. It is more accurate if comparing it to the results from PTW’s IMRT plan verification tool. After normalized the Dose at measured QA point, both results show the ISO Dose line are well comparable to the Dose distribution generated from Eclipse/RapidArc treatment plans. Data from PTW shows 94%-100% of the measured points passing criteria Gamma ≤ 1.0 (acceptance criteria 3%/3mmDTA).

Conclusion:
For all two dosimetric systems, fine agreement was experimental between measured and calculated doses distribution. Results show that 2 independent QA tools (PTW & Ion-Chamber with EDR2 films) could capably perform Quality Assurance Test for MU & Dose distrubutionVerification in RapidArc Treatment Planning.