AbstractID: 3426 Title: How monthly QA affect the IMRT QA result

Purpose:
According to TG 40, film demonstrates the width and length of field between 9.8cm to 10.2 cm are considered acceptable for a 10x10 cm field size. This work is to demonstrate under these two accepted scenarios, how IMRT QA results are affected.

Method and Materials:
Five IMRT QA plans are generated with each gantry angle set to the nominal angle (down onto phantom surface) and isocenter located at 100cm SAD, depth 10 cm. A 2D diode array MAPCHECK was set up and radiated according to the QA plan. These five QA plans were repeatedly radiated on four different days. The first exposure was done prior to the field adjustment with field size 9.8x9.9 cm for a 10x10 cm field size; the subsequent three measurements were done in three different days after the field adjustment to 10.12x9.9cm. Absolute Measured dose is compared to planned absolute dose for each detector. We also compared the measurement data with the different beam modeling sigma parameter.

Results:
Prior to the field adjustment, the passing rate for these five QA plans ranged from 42.1% to 78.3 % with 3% Dose difference and 2mm of DTA. The passing rate increased from 64.5% to 91.8% with 3% Dose difference and 3 mm of DTA. Table I present these comparisons. After the field adjustment, the passing rate range from 91.5% to 98.3 % with 3% Dose difference and 2mm of DTA. Table II, III and IV present the comparisons.

Conclusion:
Even though the field size for 9.8x9.9 cm is acceptable for a 10x10 field size for monthly QA, the consistent reduction of the field size (2mm) all the way to 1x1 dramatically impacts IMRT QA results much more so than the adjusting the sigma parameter on the beam modeling data.

Conflict of Interest (only if applicable):
NA