

AbstractID: 13397 Title: Managing the Transition of IMRT QA Systems: From Radiographic Films to Detectors Array

Purpose: This study aims to evaluate the results of intensity modulated radiotherapy quality assurance (IMRT QA) obtained with the MatriXX Evolution system and compare them to those previously obtained with, in order to implement this new technology in clinical routine, turning it more practical and still reliable. **Materials and methods:** Three moments are being compared: (i) an "Old Standard", when the IMRT QA was performed with a polymethylmethacrylate slabs phantom, ionization chamber and radiographic film in the coronal plane; (ii) "Transition", when the use of MatriXX system was initiated, but still in conjunction with a film simultaneously and (iii) "New Standard", with MatriXX alone. The measurements were performed in linear accelerators with step-and-shoot technique. OmniPro-ImRT software was used to obtain the measured dose distributions (MatriXX and digitized film) and to compare them to calculated dose distributions – by two treatment planning systems, Helax TMS and Oncentra MasterPlan. The percentage of points that meet the criteria of 3% dose difference and 3mm distance to agreement using the gamma function (γ) was evaluated, denoted here as $\gamma \leq 1$. **Results:** The IMRT QA with the "Old Standard" (141 patients) provides $2.1\% \pm 1.6\%$ average dose difference and $95\% \pm 5\%$ of $\gamma \leq 1$. During the "Transition" (48 patients), the average dose difference was $2.6\% \pm 1.4\%$, and the $\gamma \leq 1$ were $98\% \pm 2\%$ with MatriXX and $99\% \pm 1\%$ with films. Finally, with the "New Standard" (116 patients) a $2.2\% \pm 1.8\%$ average dose difference and $98\% \pm 2\%$ of $\gamma \leq 1$ were obtained. **Conclusions:** The results indicate a learning curve along this whole experience, as well as equivalence between film and MatriXX measured dose distributions, despite the distinct resolutions. IMRT QA performed with MatriXX Evolution system can properly substitute the ionization chamber and film pattern, reducing the time spent to execute these processes in clinical routine.