AbstractID: 6689 Title: A Portal Image based Quality Assurance Program using a commercial portal dosimetry software

Purpose: There is an increasing trend in Radiation Oncology Departments to replace film as a tool for localization hence Medical Physicists increasingly find themselves without access to a film processor. Films are typically used for standard routine quality assurance (QA) of linear accelerators and IMRT commissioning and verifications. The purpose of this work is to develop a QA program using a commercial electronic portal imager (EPID) and commercial portal dosimetry software available on Varian Linear Accelerators.

Method and Materials: Using Varian aS500 Portal Imager with the Portal Dosimetry Calculation (PDC) from Eclipse (commissioned according to manufacturer's recommendations), we perform a series of measurements associated with Linac QA (light-field coincidence, flatness and symmetry, off-axis ratios, etc), IMRT verifications and static and dynamic MLC QA. For light-filed coincidence we use the gradicule to "mark" the edges of the light field. For flatness and symmetry we determine a "baseline" using a phantom measurement at 10cm depth and establishing a correspondence with the Portal Imager measurement. Similar baselines are established for off-axis ratios and other measurements.
Results: We present the results of our QA measurements; analyze their level of difficulty and convenience as compared with the use of film. The QA measurements performed with the portal imager are consistent with the results from our film measurements. The IMRT verifications performed with the EPID are also consistent with the ones performed with our commercial two-dimensional diode array. We find that after we became familiar with the use of the Portal Imager and the software, the QA measurements with the portal imager are adequate and in many cases more convenient than the use of film.

Conclusion: An appropriate Linac and IMRT QA program can be developed using the Varian aS500 EPID in combination with the Eclipse Portal Dosimetry Calculation.