

AbstractID: 8179 Title: Investigation of Dosimetric Characteristics of Glass Dosimeter and Thermoluminescent Dosimeter for a Mailed Dosimetry.

Purpose: The purpose of this study was to investigate the dosimetric characteristics of glass dosimeter with respect to reproducibility, linearity, fading, angular dependence and energy dependence. The results of the glass dosimeter were also compared with those of the thermoluminescent dosimeter (TLD) in order to examine the possibility as a mailed dosimetry for a quality assurance (QA) audit program. **Method and Materials:** In this study, the model GD-301 glass dosimeter and powder type TLD-700 were used. All measurements with the exception of angular dependence were performed in a water phantom using an in-house custom designed holder stand. The angular dependence was measured with 6 MV photon beam from the Varian CL 2100 linear accelerator using a spherical polystyrene phantom. The phantom is to use for routine QA and calibration in Gamma Knife and can accommodate a number of interchangeable holders. The dosimeters were irradiated in the SSDs in Korea to achieve a reliable reference condition at a known dose. **Results:** The glass dosimeter has better reproducibility than the TLD for the Co-60 beam as well as for the clinical photon beam. The glass dosimeter signal was linear as a function of applied dose in the range from 0.5 to 50 Gy for the Co-60 gamma rays. The fading of the glass dosimeter after a received dose of 2 Gy initially was found to be within 1.7% for five months. The angular dependence of the glass dosimeter was measured about 1.4% for angles ranging $\pm 90^\circ$ from the beam axis using a spherical polystyrene phantom. **Conclusion:** The results of the glass dosimeter and TLD measurements comparing the dosimetric characteristics showed that the glass dosimeter is suitable for a mailed dosimetry in a QA audit program. For electron beam, the energy dependence of the glass dosimeter needs to be considered and corrected.