

AbstractID: 13795 Title: Impacts of the sensitometric curve depending on scanning parameters and post-operative corrections on radiochromic film dosimetry

Purpose: Impacts of sensitometric curve depending on scanning parameters and post-operative processes to correct active layer and background effects on radiochromic film dosimetry were investigated to determine the key factors for more accurate dose verification. **Method and Materials:** Dose discrepancies were evaluated in the 60°-enhanced dynamic wedged field and intensity-modulated beams using the GafChromic EBT2 films and the software developed in-house. Dosimetric effects were analyzed as the following conditions were applied: adjustment of the scanning contrast and brightness, background corrections in relative and absolute mode using non-irradiated or irradiated film corresponding delivered dose levels, and active layer correction to lessen the thickness difference of the response material. Maximum dose and pass ratio applied the gamma criteria (distance-to-agreement of 3 mm and dose difference of 3%) were compared with planning system results in the wedged and the modulated field, respectively. **Results:** Absolute dose discrepancies of 3-6 %, pass ratio difference of 1-9% were generated by the effect of the applied sensitometric curve. Dose discrepancies were lower than 1% according to the correction methods of background or active layer correction. Slope variations of sensitometric curves led to different dose differences at each dose range. Thus under the same scanning conditions, lower pass ratio was represented in modulated beams, although the discrepancy at the point of maximum dose was decreased in wedged field. When the exposed film was used for background correction, dose differences in the portion of irradiated field were reduced, but the pass ratio was not improved because of the non-uniform film response according to the dose levels. **Conclusion:** Determination of the sensitometric curve influenced by the scanning parameters was the primary factor to the dose differences. Under the selection of the sensitometric curve and post-operative correction methods, dose discrepancy can be minimized for required radiochromic film dosimetry.