

**AbstractID: 3566 Title: Evaluation of GafChromic EBT film for IMRT QA using two different scanners.**

**Purpose:** Absolute film dosimetry for IMRT QA using radiographic film is very time- and film-consuming because of film processing uncertainties. Radiochromic film requires only one calibration curve per energy per production lot. Applicability of new GafChromic EBT film for absolute IMRT dosimetry using two different film scanners was evaluated.

**Method and Materials:** GafChromic EBT (ISP, Wayne, NJ) and Kodak EDR2 films irradiated in polystyrene phantoms on a Varian 2100C/D linear accelerator were compared using the Vidar VXR-16 DosimetryPro and Epson Expression 1680 scanners. Vidar scanning was done with RIT113 software and a yellow filter for the EBT. Epson scans were done with the scanner software in 48 bit color, followed by red channel extraction. EBT films were scanned 24 hours after exposure. MSKCC's Contour software was used for dosimetric analysis.

**Results:** EBT provided better intensity linearity with dose than EDR2 and higher pixel values in the clinical dose range. The pixel values of the EBT film differed by 3-9% (Epson) and 11-19% (Vidar) when rotating the film 90 degrees on the scanner, which resulted in up to 30% dose errors when mixing directions of IMRT and calibration films. The Vidar produced lower pixel values but higher optical density than the Epson. Calibration curves based on small films cut from one sheet coincided with the curves created from a set of sheets. EBT film IMRT dose distributions agreed well with EDR2 (1.9% on CAX for the Vidar, 3.6% for the Epson).

**Conclusions:** GafChromic EBT film provides a good alternative for absolute IMRT dosimetry. Both film scanners provide equivalent dosimetric results. Calibration films and IMRT films have to be scanned in the same direction. The calibration curve can be created using small films cut from one large film.

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