

AbstractID: 1485 Title: A film based IMRT verification procedure to be done during the first patient fraction

Purpose: A fast and simple alternative to the standard film phantom method for IMRT verification is presented.

Materials and Methods: In our institution the delivered fluence map for each beam direction is documented during the first fraction by taping a radiographic film to the accelerators accessory tray. Because films tend to sag depending on the gantry angle, the lack of a coordinate system for data correlation and the presence of electron contamination of the beam, a dosimetric evaluation of these films is almost impossible. Therefore we have developed a special film tray to be inserted in one of the accessory slots of the accelerator. The tray consists of a base frame with 0.1 mm foil to reduce sagging and a 1mm copper plate to eliminate electrons. Four guided needles are used to mark a coordinate system on the film. Calibrated EDR II radiographic films (Kodak, Rochester, NY) and a Lumiscan scanner (Lumisys, Sunnyvale, Ca) are used for data acquisition. A small software tool written in IDL (Research Systems, Boulder, Co) allows to correlate measured data and calculated fluence maps from the treatment planning software. Since the ideal calculated fluence can not be measured directly, a convolution kernel algorithm is used to apply scatter from the copper plate and the electrons passing through.

Results: With this verification procedure it is possible to see even smallest differences in the fluence map resulting from leaf positioning errors. IMRT verifications and test measurements prove that this procedure can make phantom measurements unnecessary.