

AbstractID: 14242 Title: Use of GAFCHROMIC® XR-QA film for entrance skin dose and skin dose measurements during computed tomography-guided procedures; an ongoing study.

Purpose: Use of GAFCHROMIC® XR-QA film to estimate entrance skin dose and skin dose measurements resulting from computed tomography-guided procedures such as tumor ablation, cyst aspiration, and needle biopsies.

Materials and Methods: Small pieces of GAFCHROMIC® XR-QA, each measuring approximately 1 x 6 cm², were exposed to different measured radiation doses using a conventional x-ray tube. The beam energy used was 117 kVp with a measured a HVL of 5.15 mm Al. An additional 1.85 mm Al were added to better approximate the beam characteristics of a computed tomography x-ray beam of 120 kVp and a HVL of 7 mm Al. After 24 hours post-exposure, the films were scanned with a commercially available reflective-type scanner. The mean pixel value measured for each film was used to calculate a net pixel value. The film calibration curve was generated by plotting the radiation dose as a function of net pixel value and then performing a curve fit. For each of seven computed-tomography procedures selected, a GAFCHROMIC® XR-QA film strip measuring approximately 1 x 30 cm² was positioned on the patient's skin, parallel to the direction of table movement, during the entirety of the procedure. The GAFCHROMIC® XR-QA film strips were scanned and a dose profile generated.

Results: The GAFCHROMIC® XR-QA film skin dose measurements, for all the patients so far investigated, had a maximum dose ranging from 8-267 mGy with an average skin dose between 0.7-125 mGy.

Conclusion: GAFCHROMIC® XR-QA film has the potential for performing quick and reliable radiation skin dose measurements for patients undergoing computed tomography guided procedures. Skin dose profiles may be used to determine maximum or peak skin dose, to provide feedback to physicians on their radiation management techniques, and to optimize the CT scan parameters in order to minimize patient dose while maintaining diagnostic quality imaging.