

AbstractID: 13315 Title: The Effect of Cloth and Paper Gowns on Skin Dose for 6 MeV Total Skin Electron Treatments

Purpose: Traditionally, patients treated with total skin electrons are required to remove all clothing. This is assumed to be best for the treatment of superficial skin lesions out of concern clothing may significantly perturb the electron dose delivered. However, no known peer-reviewed studies have been done to validate this. We investigate what effect cloth and paper gowns will have on dose near the skin surface. **Method and Materials:** Using a Markus ion chamber and Gafchromic-EBT2 film, dose to a cylindrical phantom was measured with a cloth hospital gown, a paper gown, and a tri-layer cloth (to simulate folds and seams) compared to no covering. A 6-MeV electron beam with spoiler accessory was used at a distance of about 4-meters, with gantry angled at 248° and 292°. The materials covered the films which were placed onto the phantom at 1000-MU per shot. The phantom was rotated at -60°, 0°, and 60° relative to the beam's central axis simulating the six-field Stanford technique. Similar procedure was followed for Markus chamber with 1-mm buildup cap in a Lucite phantom. Effect of air gap of 0, 3, and 5-cm between full-size gowns and ion chamber also investigated. **Results:** Compared to no covering, the films revealed a 0.8% increase in dose for cloth, 1.8% for tri-layered cloth, and 0.7% for paper. Markus chamber readings revealed at 0°, 60° orientation -0.03%, -1.5% for cloth, 1.4%, -4.1% for tri-layered cloth, and 0.2%, -0.2% for paper, respectively. Air gaps had differences by less than 0.7% for cloth and 0.2% for paper. **Conclusion:** For cloth and paper gowns there was a variability of less than 1.5% in dose delivered. Air gaps did not substantially affect dose but folds and seams in cloth may perturb dose more than 4%. For patient comfort, paper gowns may be most appropriate covering option.