

AbstractID: 8437 Title: Dual-fields rotational total skin electron irradiation/therapy

Purpose: We have developed a new technique for rotational total skin electron therapy (RTSET). The technique combines the rotational method of McGill University with the Stanford University angled dual-fields method. We report dosimetry characteristics and *in-vivo* dosimetry.

Methods and Materials: Patients stand on a rotational (0.9 rpm) platform at an extended SSD (332cm) with field-size 133-cm by 133-cm. The gantry is angled 70° and 110° so that beam points above patient's head and below patient's feet, respectively, in order to minimize contaminant x-ray dose. A "high-dose-rate" mode (600 MU/min) on a Varian-21EX delivers a 6 MeV-electron beam. Daily treatments require only about 0.5 h, one-half of which is used for patient set-up. Shields are used for eyes, nails, and toes. Dosimetry measurements include static dose-rate at extended SSD, rotational dose-rate for a rotating patient/phantom, and a power law correction for SSD variation. *In-vivo* dose measurements are performed using XV-films and MOSFET. Films strips are attached firmly on patient's skin to avoid any air gaps.

Results: We obtained $MU = Dose / (0.0751 * 0.39 * (332/SSD)^{2.25})$. Therefore, a prescription dose of 125cGy at 325cm SSD required 4068 MU or 7.5 revolutions. The dose distribution along the vertical direction was measured by a parallel-plate ionization chamber in a phantom. For a patient prescribed 116cGy daily, the average measured surface dose with film was 110cGy, within 5% of prescribed dose. *In-vivo* MOSFET on a patient prescribed 125cGy daily, measured doses were distributed from 99% to 102% from the prescribed dose of 125cGy.

Conclusion: The dual-field RTSET offers combined advantages of shorter beam-on time, uniform dose distribution, larger treatment fields, and less x-ray contamination than other techniques. Our *in-vivo* measurements revealed that delivered dose matched prescribed dose to < 5% and dose uniformity was within 6% variation.