

Homogeneous irradiation of the entire or a large portion of the superficial scalp poses both technical and dosimetric challenges. Some techniques will irradiate too much of underlying normal brain while other techniques are either complex and involve field matching problems or may require sophisticated linac add-ons such as intensity modulated radiation therapy /electron multi-leaf collimator. We propose a practical treatment technique that can be delivered with a standard linear accelerator capable of producing high-energy electrons. The proposed technique offers a simple alternative way of achieving results equivalent to intensity modulated radiation therapy. Dose homogeneity throughout the treatment volume is achieved by aiming different energy electron beams at differential areas of the treatment surface to achieve improved dosimetry and rapid treatment delivery, while using a single set-up point. Idealistically, the treatment surface is envisioned as a set of concentric circles. The lower of the electron energies used treats the treatment surface represented by the innermost circle and the concentric rings outward are treated by higher energy electrons. Depending on clinical indications and target volume different energy electron beams are combined. Typically, an electron applicator large enough to encompass the entire treatment surface plus a margin is used and applicator-inserts defining each beam's treatment surface are changed between beams. Using a 3-D RTP system, the optimal beam weights were selected to minimize the dose variation in radial direction across the entire target volume. We introduced this treatment modality in our institution to treat superficial cancers of the scalp and other irregular surfaces.