

The dose distribution of stomal electron boosts

An en face electron boost of approximately 10 Gy is often given to stomal and peristomal tissues. This region is usually assumed to be water equivalent but because the stoma is an air cavity, the dose distribution is more complex. We made two lucite stoma phantoms: a 2.5 cm diameter circular hole of depth 2 cm and an elliptical hole of dimensions equal to the average stoma length, width and depth (2 cm x 1.7 cm x 3.5 cm) determined from CT scans of 20 patients. Film and diode measurements were made with the phantom on standard polystyrene slabs with the hole centered in a 7 cm circular field at SSD of 100 cm for 9 and 12 MeV electrons. Measurements were made at shallow depths below the bottom of the hole and also at approximately 6 cm from the top of the phantom (to represent the cord). The combined effects of lateral scatter from the lucite surrounding the hole and the reduced equivalent thickness for electrons passing directly through the hole increase doses at both shallow and cord-like depths. The effect is more pronounced for 12 MeV electrons and may lead to clinically significant normal tissue effects, especially for patients with large stomas. Measured dose distributions and dose distributions calculated for a patient CT scan with a pencil beam dose deposition kernel algorithm will be presented.