

Evaluation of Output Factors for Customized Electron Cones

The output factor for customized electron inserts depends upon the open area of the insert, the electron energy, the displacement of the center of the insert w.r.t. the center of the open cone and the virtual source to skin distance (SSD_{vir}). The output of over 100 inserts has been evaluated. 58 inserts were evaluated with center displacement ranging from 1 cm to 3 cm. The best representation of the output for dose calculations is the output at the center of the insert. 44 customized inserts used for treatment of patients were evaluated for cone sizes of 6x6, 10x10 and 15x15. The output factors for all these inserts were measured for electron energies 6, 9 and 12 MeV. The percentage open areas of these customized inserts varied from 18 % to 58 % of the open cone area. We find that the output factor of any insert can be derived from the best function fit obtained from the data in the pool. The derived output factor is within 1 to 2% of the measured value. Similarly, the output for the regular symmetric inserts was evaluated for different virtual SSD (SSD_{vir}), we find that the output can be obtained from a formula. Thus, the output can be obtained for any customized insert for a known electron energy, % open area, at a fixed SSD from the pooled data and apply the correction factor for the SSD_{vir} if application needs the output at a non standard SSD.

