

Peripheral dose is the dose outside the clinically useful radiation field resulting from leakage through the collimator / source head, from scatter within the patient and from surrounding materials. Although a small fraction of the prescribed dose, peripheral dose can be significant for radiation sensitive organs or devices outside the treatment volume. Treatment facility and machine specific peripheral dose data are quite useful in risk reduction and, perhaps, in the selection of optimal treatment technique.

Peripheral dose measurements were made in a large phantom ($30 \times 30 \times 90 \text{ cm}^3$) using a 5.3ml ionization chamber for various photon energies (Cobalt to 15MV x-rays) and field sizes (5 to 20 cm^2). The peripheral doses were obtained at clinically relevant depths from d_{max} to 15cms using an SAD set-up, and at distances up to 67.5cm from the field edge. To determine the effect of beam asymmetry, measurements were made using both symmetric and asymmetric (half field) collimation. The peripheral doses increase with field size, decrease with distance from field edge, and have a small dependence on beam energy. There is a small dependence on the depth, which becomes insignificant at 20cm beyond the field edge. The differences between symmetric and asymmetric collimation are apparent only for large fields at short distances ($<20\text{cms}$) from the field edge. Machine design is observed to have a small but measurable effect. The peripheral dose data are more easily compared when normalized to 100% dose at the isocenter at each particular depth.