AbstractID: 4389 Title: MU variation for Total Body Irradiation (TBI)

Purpose: To determine a simplified formula to calculate monitor unit (MU) for total body irradiation (TBI) for 6 MV photon beams.

Method and Materials: Patient data were accumulated for TBI with 6 MV photon beams between January 2002 and February 2006. The dependence of MU on SAD, patient thickness, and field sizes were examined for four different linear accelerator types.

Results: MU depends strongly on SAD but is almost independent of the linear accelerator types. Among the 47 patients examined, the depth varied between 6.5 and 21.5 cm (mean and s.d.11.5 $\pm$ 3.6 cm), the field sizes varied between 20 and 50 cm (mean and s.d.35 $\pm$ 8 cm) and SAD varied between 492 and 591 cm. MU is linearly proportional to the thickness of patient separation and, to a lesser extent, linearly dependent on the equivalent patient field size. To deliver 200 cGy, the mean and standard deviation of $MU*(100/SAD)^2$ is 113 $\pm$ 11 for all patients examined.

Conclusion: To deliver 200 cGy with 6 MV photon beams, MU can be determined using a formula $MU*(100/SAD)^2 = 2.63\,d + 82.6$ to within an accuracy of 5.7% for most of patients examined. To increase the accuracy further, requires taking into account the field size dependence.