

AbstractID: 1544 Title: A Novel Technique for Total Body Irradiation in a Small Treatment Room

Total body irradiation (TBI) is commonly used with autologous bone marrow transplantation for treatment of hematologic malignancies such as leukemia. Several different techniques have been developed to deliver TBI and have been described in the literature. The objective of TBI is to irradiate the whole body as homogeneously as possible. A value of  $\pm 10\%$  is often considered acceptable due to the limitations and complexity of the technique. A common problem with TBI is the maximum field size of  $40 \times 40 \text{ cm}^2$  generated by conventional linear accelerators. To overcome this, the source to patient distance may be increased or the patient may be translated through the radiation beam. Neither technique was suitable in this case due to the small size of the treatment room; the largest source to patient distance available with a lateral field was 3 m. A technique was devised using a gantry tilt with a copper filter, with the patient on the floor. For patients taller than 1.2 m, two fields matched at midplane were used. Patients shorter than 1.2 m (typically pediatrics) were treated with a single field. This technique was successfully implemented for TBI with a dose homogeneity of  $\pm 10\%$ . This technique provides an easy method for treatment of adult and pediatric patients, and can easily be adapted to allow shielding of the lungs.