

Purpose: A single fraction of 2 Gy total body irradiation (mini-TBI) has been used for immunosuppression therapy for stem cells transplantation. Because of the low dose, blocks are not required. For patients in excessively ill health, it can be very difficult to hold a standing or seated position for the length of time required to deliver a full mini-TBI treatment. Small linac rooms can make it impossible for a patient to be treated lying down in the traditional manner both because of space and field size limitations. We have developed a simple technique to deliver a mini-TBI treatment to a patient lying down in a room with minimal space.

Method and Materials: Linac was setup with gantry and collimator rotated to 45 degree projecting a 210 cm long light field on the floor. Patients up to 190 cm height can be setup on the floor and treated with SAO, SPO, IPO, and IAO fields each giving $\frac{1}{4}$ of the dose. The patient was repositioned exchanging first supine/prone and then head/feet to complete treatment. Dosimetry was evaluated with the Eclipse treatment planning system and verified with ion-chamber measurement in acrylic phantom. Effects of energy and beam spoiler were also investigated.

Results: Treatment setup was simple and showed a homogeneous dose distribution. The mid-plane doses at 70 and 90 cm away the center were 110% and 116% of the prescription, respectively. The high dose area can easily be reduced by using 1-3 mm thick lead sheets mounted on a blocking tray as a partial transmission filter. Dose at 3 mm from surface was 99% of the prescription treated with 6 MV without spoiler.

Conclusion: A single dose of TBI can be safely delivered with the method described in this study. Patient's comfort, setup complexity and treatment time were significantly improved using this method.