Purpose: To test the idea of using Intensity Modulated Radiation Therapy (IMRT) for administering Total Body Irradiation (TBI) on a clinical linear accelerator (CLINAC).

Methods: A half body phantom which mimics the size of a pediatric patient was used as the basis for planning a total body irradiation with intensity modulated radiation. The phantom consisted of head, neck, left lung, right lung, and torso which were contoured in the 3-dimensional CT images to apply for IMRT. Within the interior of the phantom both the right and left lungs were present for contouring as organ at risks. The Eclipse treatment planning system (Varian Medical Systems) was used for the simulation of the treatment. A 6 MV beam from a Siemens medical linear accelerator was used for irradiation of the phantom. To perform the quality assurance of an IMRT-TBI plan, Matrixx OmniPro-I’mRT system was used.

Results: The doses to different body parts of the phantom were uniformly distributed as demonstrated in the IMRT treatment plan and the dose volume histograms. The total irradiation doses to the lungs and to the body were well under controlled as prescribed. These results indicate that IMRT is a feasible approach for administering Total Body Irradiation.

Conclusions: The use of IMRT to deliver total body irradiation may be an acceptable alternative to the conventional method of total body irradiation on a CLINAC.